

# Railway Age Gazette

SECOND HALF OF 1916—No. 19.

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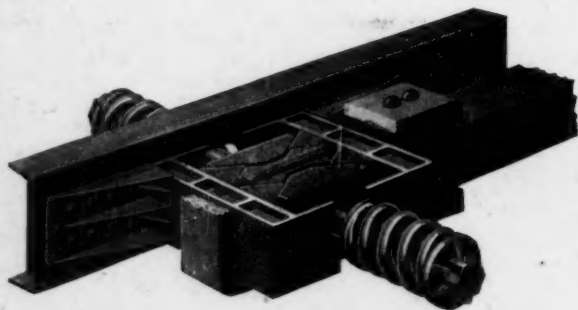
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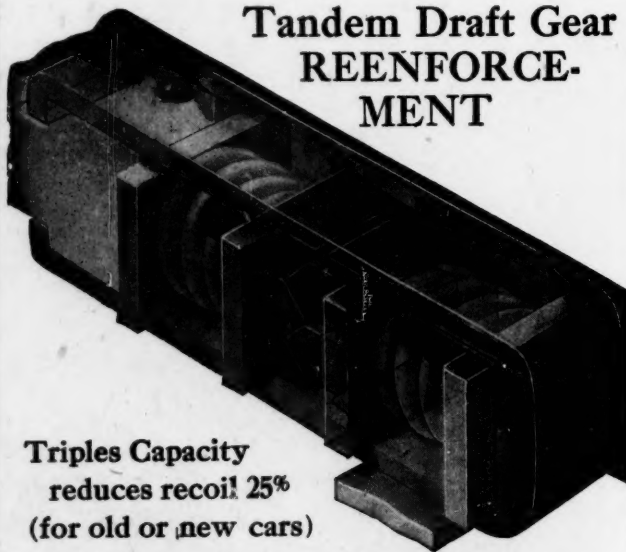
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# Railway Age Gazette

Volume 61

November 10, 1916

No. 19

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\*Illustrated.

Frank A. Vanderlip, of the National City Bank, in his address before the Society of Railway Financial Officers, which is published elsewhere in this issue, calls on the railroad men of this country to make for themselves a new era of railroad management and regulation. This call to make a broad, statesmanlike study of the railroad situation instead of an individual and selfish one, coming as it does from a man whose breadth of vision is extending American banking and commercial activities into Russia and through South America, should be an inspiration and a whip. It should be from among railroad men themselves that the suggestions for the solution of their great problems should come. Railroad executives have been made to feel at times that there is no longer an opportunity for the individual of extraordinary ability to exercise this ability in the management of railroads. Mr. Vanderlip points out a way in which there is an opportunity and responsibility for the best minds in the railroad world. That this opportunity is recognized and that this responsibility is being assumed, is indicated by the constructive program for better regulation which has been worked out and is being promoted by the railway executives advisory committee under the leadership of its chairman, Frank Trumbull.

With the congestion of business in the steel mills showing no relief, the railways are being confronted with a serious problem in maintaining their properties to their accustomed standards. Serious as is the increase of \$5 per ton or 17 per cent in the price of rails and further greater increases in the costs of other track materials, these have been overshadowed by inability to secure early deliveries regardless of price. With the large tonnage of unfilled orders now on their books the mills are not actively soliciting domestic rail orders, as is illustrated by the report that one mill received an unsolicited order for 25,000 tons of rails by mail a few days ago. Many of the large roads placed orders last spring for their 1917 rail requirements so far as they could then determine them. Those roads which did not do this are now in an unfortunate position, for not only has the price increased, but they cannot now secure materials for delivery before next fall. While a

road can ordinarily postpone a certain part of its program of rail renewals safely for a time, a continuance of this policy for any considerable period will lead to disaster. The high prices of materials and a shortage of labor have led to the postponement of much work this year. A repetition of this program during the ensuing season will inevitably be reflected in the condition of the property. The railways of this country are essential to the conduct of business, particularly during times of prosperity such as now exist, and their proper maintenance is essential to the performance of the tasks placed upon them.

When the federal valuation of the railways was first undertaken there were many and varied estimates of the cost of this work to the railways and to the government. Now that it has been under way for nearly three years and the field work is approaching completion on a few roads, it is possible to secure some approximate data regarding the actual expenses which these lines have incurred. The annual report of the New York, New Haven & Hartford for the fiscal year ending June 30, 1916, contains a statement that the valuation department of that road now includes about 145 employees and that \$301,783.94 had been expended up to that time while \$200,000 has been appropriated for the work for the following year; and no report is expected from the government until after January 1, 1918. In other words, this valuation will cost considerably in excess of \$500,000 or over \$250 per mile for the 2,005 miles of the New Haven. The recent annual report of the Great Northern, a typical Western road, states that \$487,000, or approximately \$67 per mile, has been expended for valuation, while the field work is not yet finished. It is, therefore, reasonable to assume that the preliminary cost on this road will exceed \$75 per mile, and probably approach \$100. This wide variation results largely from the fact that the New Haven is an old, highly developed property with numerous large and involved terminals, while the Great Northern is of recent construction, with few large terminals and similar complications. The cost of this work will also vary widely on different lines depending on the extent to which re-surveys are made by railway forces to check the results of the govern-

### A Call to an Imperative Duty

### The Railways and the Steel Market

ment. However, considering these two roads as typical Eastern and Western properties, it is evident that this work will cost the railroads considerably in excess of \$100 per mile of line; probably \$150 will be more nearly accurate when all charges, including legal and other expenses incident to the final acceptance of the valuation reports, are in. At this rate the railways will be subjected to a total expenditure of from \$35,000,000 to \$50,000,000, in addition to the part of the expenses incurred by the government which they, as tax payers, will have to bear. No data are available for satisfactorily estimating the total expense that will be incurred by the government.

The advantages of close co-operation between the railways and the leading universities have been pointed out in these

#### Advisory Boards for Universities

columns in the past and are pretty generally recognized in the abstract. Concrete examples of such co-operation, however, are rare enough to give considerable interest to the creation by the University of Illinois of an advisory board composed of five representatives of Illinois roads. These executive officers—C. H. Markham, president of the Illinois Central, R. H. Aish-ton, President of the Chicago & North Western, W. G. Bierd, president of the Chicago & Alton, Hale Holden, president of the Chicago, Burlington & Quincy, and W. B. Storey, vice-president of the Atchison, Topeka & Santa Fe—held their first meeting as a board on last Friday at Urbana, and are now organized for service. This board will deal only with the larger problems in connection with the department of railway engineering, but the channel of intercourse which they provide between the university authorities and the railways should result in further development of work that is already important. This school, in common with many other large institutions, has done much in recent years to improve its facilities, both for training students to enter railway work, and for conducting scientific investigations of value to the roads. All railway men should co-operate willingly with universities that are doing such work in order to direct their efforts along lines which will result in the greatest good.

### SOME UNDERLYING FACTS ABOUT THE CAR SHORTAGE

THE freight car situation on the railways of the United States is deplorable; or rather, to state the case more accurately, the situation with respect to facilities in general is deplorable. The roads are being offered more traffic than they can handle. Doubtless, they eventually will get it all moved, but after delays, inconvenience and loss, if not actual suffering to the public. Many other classes of concerns are relatively as badly off, but the deficiencies and troubles of the railways are given more advertising than those of mine operators, manufacturers, etc. Nobody blames the manufacturer for not being able to supply the railways with cars as fast as they are ordered. Everybody knows that the manufacturer cannot deliver cars to the railroads until they are built. But many do not recognize the fact that a railway cannot deliver cars to a shipper if it does not have them, and that it cannot get them before the manufacturers have built them. Furthermore, cars cannot be built until they have been ordered, and they cannot be ordered until the railways have money with which to pay for them. The railways at present have money with which to buy cars, but they cannot now get them built fast enough to do much good. Up to fifteen months ago they could have got plenty of cars built, but then they did not have enough money with which to buy them.

The changes which have taken place in the car situation

are, perhaps, best indicated by the increases which have occurred in the number of freight cars in service and in their tonnage capacity. The statistics of the Interstate Commerce Commission regarding the tonnage capacity of cars begin with the year 1903. The period from 1903 up to the panic in October, 1907, was one of rapidly increasing business and large purchases of equipment. Most of the vast number of cars ordered in 1907 were delivered in the fiscal year ended on June 30, 1908. Therefore, the five-year period from 1903 to 1908 affords an instructive basis for comparison. The increase in the total number of freight cars in service in that five years was 435,520 and the increase in their tonnage capacity was 24,133,384 tons. Since then the railways have had some years of good business, but most of them have been bad, and therefore there was a heavy decline in the orders for equipment. This is reflected in the statistics of the Interstate Commerce Commission. Between the end of the fiscal year ended June 30, 1908, and the end of the fiscal year ended June 30, 1915, the increase in the total number of freight cars in service was only 229,003. This was 206,517 less than it was in the preceding five years. The increase in the tonnage capacity of the cars in service was only 19,318,787 tons. This was 4,814,597 tons less than it was in the preceding five years.

It is well known that in spite of the fact that the increases in the number and capacity of freight cars in the seven years ended with 1915 were much less than in the preceding five years, this latter period of seven years was almost constantly one of enormous car surpluses. Even as late as August 1, 1915, the net surplus of freight cars in the United States was 264,243.

Then with amazing suddenness came the big increase in traffic with which the railways have been struggling ever since. During the fall and winter of 1915 there was a bad congestion at the eastern ports and sporadic car shortages at different places, but there never developed throughout the country as a whole a serious situation. The railways moved a record-breaking business with a relatively small car supply. They were able to do this because of a very great increase in the efficiency with which they handled their cars. It is a familiar fact that until a few years ago the average movement per freight car per day seldom exceeded 25 miles. Statistics regarding this point for the railways of the entire country are no longer compiled, but the figures for individual roads show that many lines, and probably the railways as a whole, have made very great increases in the average miles per car per day, some of the large systems now exceeding 35 miles. While they were handling a record business last fall and winter the railways began greatly to increase their orders for equipment. The statistics of the *Railway Age Gazette* show that in the first ten months of 1915 they ordered only 67,781 cars, while in the corresponding months of the calendar year 1916 they ordered 89,323 cars. In the week ended November 4 all records for the year were broken, when the orders for freight cars aggregated 15,043.

Unfortunately, the number of cars now being ordered is no indication of the rapidity with which the present acute situation will be relieved. In the first place, the manufacturers are so deluged with orders that it will be many months before they will be able to fill those they already have, and, in the second place, the present trouble is not merely a shortage of cars, but a shortage of transportation facilities of all kinds.

If the railways now had enough cars to supply one for every one ordered it is probable that when they got them all under load their tracks and yards would become so blocked that they would be unable to move much more traffic than they are at present handling. The term "car shortage" is now, as always, merely a misnomer used to describe a condition resulting from the inability of the roads to supply

facilities enough of any kind to handle the business available.

These being the facts, how much blame ought to be visited upon the railway managements for the existing conditions? Has the country never faced similar conditions before? It did back in 1906 and 1907. Has it never been warned that they were likely to recur? It has constantly been warned of it for ten years. It has been pointed out over and over again that the policy followed by the state and national governments in regulating the railways has so restricted their earnings and increased their expenses that their net return has become inadequate. It has been shown that because of this fact the railways have become unable to raise enough capital. It has been shown that when they become unable to raise enough capital they are rendered incapable of so expanding their facilities as to make them adequate to handle the country's commerce. It has been pointed out that there were more miles of railways in the hands of receivers in 1915 than ever before in history, that the new mileage built in that year was less than in any year since the Civil war, and that in the fiscal year ended June 30, 1915, there was an actual decrease in the number of freight cars in service. How has the public responded to the presentation of such facts and to the warnings based upon them? Until recently it has to a large extent ignored them.

It is a significant coincidence that the country is confronted with the worst car shortage and congestion of traffic in its history just when the Newlands committee is getting ready to begin its investigation of the entire subject of regulation of railways. The best evidence of the need for this investigation is the present traffic situation. It is not only a natural but an inevitable result of the policy that has been followed for ten years, and unless this policy is reformed, crises such as the present are going to become more frequent and violent.

The Interstate Commerce Commission has begun this week at Louisville a general investigation of the car situation. The American Railway Association, which will meet in Denver next week, will consider the questions of increasing the per diem rate and the demurrage rate. It is proposed to advance the per diem rate to a minimum of 45 cents and a maximum of \$1.25. It is also proposed to establish a demurrage rate of \$2 for the first day a car is held after the 48 hours of free time have expired, \$3 for the next day, \$4 for the next day, and \$5 for all later days. The Interstate Commerce Commission will doubtless do some good by its investigation. The increases in per diem and in demurrage rates which the American Railway Association is considering will, if adopted, expedite the movement of equipment.

But, after all, anything that either the commission or the railways will do within the next few months will merely alleviate and not remedy the situation. And what is the essential vice in the policy of regulation, which causes it to contribute toward the development of such conditions? Simply this: It so controls the rates of the railways that most of them do not in fat years earn enough money to tide them over the lean years. Consequently, in the lean years their expenditures for maintenance, and for improvements and increases of facilities, are restricted to the utmost in order to keep them out of bankruptcy, and they cannot in the fat years make large enough expenditures for maintenance and large enough investments in improvements to offset the heavy retrenchments made in the lean years. A policy which does not recognize the fact, as our policy of railway regulation does not, that every industry has to go through bad as well as good years, but which on the contrary is predicted on the assumption that rates which are hardly sufficient for prosperous years will be sufficient at any time, is bound at frequent intervals to give rise to such conditions as those with which the country is now struggling.

## INTIMIDATION BY THE B. OF L. E.

THE question whether all railroads should be required to equip their locomotives with high-power headlights, which has been the subject of a hearing before the Interstate Commerce Commission for over a week, pales into comparative insignificance alongside the testimony presented at the hearing regarding the methods practiced by the Brotherhood of Locomotive Engineers to intimidate and coerce its members who are inclined to express their views on a matter of such vital importance to themselves. A most remarkable state of affairs, not entirely unsuspected by those who have been familiar with railroad matters, was disclosed when the commission decided to admit the testimony reported elsewhere in this issue, of engineers who have been expelled from the brotherhood, deprived of their insurance and ostracized by their fellow employees at the command of the chief executive of the brotherhood, for giving public utterance to opinions at variance with those entertained for their benefit by the leaders of the organization.

The railroads and the engineers who testified have performed an important public service in thus calling attention to a condition which has long been known to exist, but which it has been difficult for free American citizens who do not belong to labor unions to appreciate.

The four brotherhoods of train service employees recently gave an effective demonstration of the power they were able to exercise over the Congress of the United States. This has served to throw some light on the manner in which they have been able to exercise so potent an influence over state legislatures for several years, as well as to explain why they have been so successful in forcing concessions from the railroad managements.

The explanation given by witnesses in this proceeding of the way in which the brotherhood chiefs have been able to intimidate their members who do not approve of their legislative plans may help to explain in part the unanimity with which the members of the same organizations on several occasions have voted to throw up lucrative jobs at the behest of the same leaders. The explanation will hardly serve to increase the self esteem of the members of Congress and of the legislatures who have allowed themselves to be bluffed by organizations whose strength is derived from such methods.

The sections of the constitution and statutes of the Brotherhood of Locomotive Engineers prohibiting members from expressing an opinion against the legislative plans of the officers, which were brought out at the hearing and which the engineers who dared to express their honest opinion as to electric headlights were charged with violating, show the extent to which the members of the organization are required to subordinate themselves to the will of the labor oligarchy. Section 3 of the constitution, which was not read at the hearing, expresses the same fact in even plainer language. It provides that the grand international division of the brotherhood, composed of its chief officers, "shall have exclusive jurisdiction over all subjects pertaining to the brotherhood, and its enactments and decisions upon all questions are the supreme law of the brotherhood, and all divisions and members of the order shall render true obedience thereto."

One of the engineers who testified on behalf of the railroads, but who was rather nervous about the prospect, was reassured by "Brother Stone" that "nobody who tells the truth was ever thrown out of the brotherhood." The record does not show whether he asked Stone for any further reassurance on this point after two other engineers had testified that they had been ousted from the organization by Stone's direction on the sole evidence of the fact that they had testified before the commission unfavorable to high power headlights and that the truth of their statements had

not even been brought into question. The question of the truth or falsity of a statement on such a subject apparently comes under the "exclusive jurisdiction" of the brotherhood officers whose decision is the supreme law of the organization and its members.

The headlight hearing has also served to furnish another illustration of the close partnership that appears to exist between the brotherhoods and the locomotive boiler inspection department of the Interstate Commerce Commission, whose chief officers appeared as the principal witnesses for the brotherhoods and sided with them throughout as against the railroads. President Carter of the Brotherhood of Locomotive Firemen and Enginemen, said that the brotherhoods had refused to have anything to do with the "ex parte" headlight tests conducted by the New York Central, but he wanted to have the commission conduct a series of tests of its own. As such tests would naturally be conducted by the boiler inspection department, which has already recommended the rule proposed by the brotherhoods, Mr. Carter's suggestion is rather amusing, to say the least.

### KANSAS CITY SOUTHERN

THE Kansas City Southern is the only road of its group in the southwest which has continued to pay dividends on any class of stock, and most of its competitors have gone into the hands of receivers during the past few years. The Kansas City Southern's ability to continue to pay 4 per cent on its \$21,000,000 preferred stock has not been because of an extraordinarily large increase in gross business. The reverse is true. Its increase in traffic has been below normal.

Total operating revenues in the fiscal year ended June 30, 1916, amounted to \$10,584,000, comparing with \$10,036,000 in 1915, with \$10,993,000 in 1914, the best year in the company's history, and with \$9,595,000 in 1910. It was in 1910 that a program of betterment work was begun, which is still in the process of being carried out. Compare this with the Rock Island, with operating revenues of \$75,347,000 in 1916, \$70,948,000 in 1915, \$71,365,000 in 1913, the best year in the history of the company, and \$66,221,000 in 1910. In fact, most of the Kansas City Southern's competitors will show a larger proportionate gain in gross in 1916 as compared with 1910, and with intervening years, than it does. How, then, are we to explain the fact that the Kansas City Southern earned in 1916 net income available for dividends of \$1,671,000, and after paying 4 per cent on its preferred stock carried to profit and loss an amount almost equal to the \$840,000 paid out in dividends.

One of the first things that strikes the attention in comparing 1916 with either 1915 or with 1910 is the transportation expenses (out of pocket cost of doing the business). In 1916 transportation expenses were \$3,299,000, or less by about \$99,000 than in 1915 and about \$37,000 less than in 1910. The ratio of operating expenses to total operating revenues was 59.58 in 1916, 64.08 in 1915 and 65.56 in 1910. When the program of improvement was started in 1910 an operating ratio of 58 and a transportation ratio of 28, with an average revenue trainload of 650 tons and a gross business of \$15,000,000, were aimed at. The management actually did a little bit better than had been aimed at in transportation ratio. It was slightly over 27 in 1916, but in this respect the management was helped by the fact that the average ton-mile rate was 7.44 mills in 1916, comparing with 6.92 mills in 1915 and 7.25 mills in 1910. In gross earnings and in trainload the estimates of 1910 have not as yet been met. The trainload of revenue freight in 1916 was 548 tons; in 1915, 542 tons, and in 1910, 361 tons.

The showing made in transportation expenses in 1916 was remarkably good because there were adverse conditions under which the management had to labor that are not shown in a simple comparison of revenue or of traffic. The total ton

mileage of revenue freight in 1916 was 1,099,973,000, a decrease as compared with the previous year of 28,760,000 ton-miles, or between 2 and 3 per cent. The passenger mileage was 66,821,000 in 1916, an increase of about 2,200,000. No new locomotives were added during the year and the traffic was much more unbalanced than in other years. The total freight car mileage was 73,311,000 in 1916 as against 72,517,000 in 1915. The tonnage of revenue freight per loaded car was 21.49 in 1916 and 21.67 in 1915.

One of the great difficulties with the operation of the Kansas City Southern is that the great bulk of the tonnage moving over the northern half of the road is northbound tonnage. Conditions of the balancing of traffic on the southern half of the road are not so bad, although even here northbound tonnage predominates. Conditions were much worse than normal in 1916 because of the movement of grain to the Atlantic seaboard instead of to the gulf, and to the lack of ships for export loading at Port Arthur.

The Kansas City Southern's operations are particularly



The Kansas City Southern

interesting because they present railroad problems simplified, inasmuch as averages for the whole road are not affected by the inclusion therein of figures for the operation of a large proportion of branch line mileage. The Kansas City Southern operates 777 miles of main line running from Kansas City to Port Arthur, with only 46 miles of branch lines.

In the program inaugurated in 1910 for the improvement of the road and betterment of its operating ratio no provision was made for further considerable grade reductions beyond the four divisions already placed on a 0.5 basis. The management undertook to meet the increasing wage scales and increasing prices of materials by getting more work out of the locomotives or by substituting heavy for light locomotives, reducing the amount of fuel consumed per mile run, holding down the cost of water for locomotives in the face of rapidly rising costs per 1,000 gallons, cutting out overtime and constructive mileage through a re-arrangement of terminals, and

reducing the debit balance per diem and reclaims by increasing the average mileage per car per day. Incidentally, of course, this program necessitated a very considerable rehabilitation of the line and structures. The principal changes in this respect were revision of about 150 miles of line, the replacing of 56 to 70-lb. rail with 85-lb. rail, ballasting the whole line with gravel or rock (previous to 1910 most of the line that was ballasted was ballasted with chats or sand), improvement of drainage and widening cuts and fills, replacement of wooden trestles with fills or culverts, replacement of bridges with a change of standard from Copper E 30 loading to Cooper E 50, and fencing right of way.

There was a total of 208 locomotives in service at the beginning of 1910; at the end of 1916 there were 192 locomotives in service. During this time the company had bought 12 Mallets, 8 Pacific type locomotives, 15 Consolidations and 4 switching locomotives, all of which were equipped with superheaters. During the past year 20 locomotives were equipped with superheaters, brick arches, automatic fire doors and new piston valves. The present program calls for making these improvements to the locomotives at the rate of 20 a year. As illustrative of the way in which the problem of getting more work out of locomotives has been met, a single instance might be cited where it had first been decided to make a grade revision by cutting out a ruling grade on the division which reduced the rating of locomotives over the whole division by a considerable percentage. By putting Mallets on this district and by shortening it so that the run could be made without overtime and running the locomotive simple instead of compound over the ruling grade, the full rating for the compound operation of the locomotive could be given it over the whole district. New terminals were located at Watts, Okla.; Heavener, Okla.; De Queen, Ark., and Leesville, La. New shops were built at Shreveport, La., and Pittsburg, Kan. This made seven divisions for 773 miles of main line and did away with a great amount of overtime and constructive mileage.

In 1910 hire of equipment cost the Kansas City Southern \$235,000. In 1916 this had been reduced to \$110,000. The company had in service at the beginning of 1910 6,908 commercial service freight cars and at the end of 1916 4,894 commercial service freight cars. In other words, apparently by far the greatest part of the saving in car hire has been due to a greater mileage per car per day on the Kansas City Southern. All main line as the road is, it ought to have a high average mileage per car per day if the yards are properly placed and kept clear. At present the car mileage per day is between 35 and 40 miles.

Of the program of improvement started in 1910 the greater part of the ballasting has been done, the change of terminals has been completed, the grade revision has been completed, and there still remains to be done the improvement to existing locomotives at the rate of 20 per year, some further bridge strengthening, and especially important, a further reduction in the debit balance of hire of equipment.

Total transportation expenses in 1916 amounted to \$3,299,000, a decrease as compared with the previous year of \$99,000. The principal savings were made in the cost of fuel and in other costs of train service. The price per ton of coal was \$2.05 in 1916 and \$2.01 in 1915, but the miles run per ton of coal used was 12.34 in 1916 as against 12.10 in 1915, an increase of 2 per cent. The price per barrel of oil was 60.69 cents in 1916 and 64.68 cents in 1915, and the miles run per barrel of oil used was 3.07 in 1916 and 3.02 in 1915. Most of the Kansas City Southern yard engines burn oil, and the total amount spent for fuel for yard locomotives in 1916 was \$147,000, a decrease as compared with the previous year of \$21,000, notwithstanding the fact that the wages of yard enginemen amounted to \$113,000 in 1916, an increase of \$8,000 over the previous year.

The opening of the Panama canal ought to help the Kan-

sas City Southern. If the road can get increased revenues, a further reduction still in many of the items under transportation expenses ought to be possible. The ratio of maintenance to gross, even if gross considerably increases, will probably not change greatly. Such items, however, as despatching trains, station service, yard service, and with heavier trainloads, wages of enginemen and trainmen, loss and damage to freight and injuries to persons, and damage to stock on right of way, ought to decrease.

During the year the total expenditure for additions and betterments was \$981,000. There was \$1,000,000 of refunding and improvement mortgage bonds sold, making a total outstanding of \$18,000,000 of these bonds, of which the total authorized issue is \$21,000,000. In the near future probably, therefore, the Kansas City Southern will have to provide some new means for financing its capital needs.

The following table shows the principal figures for operation in 1916 as compared with 1915:

	1916.	1915.
Average mileage operated.....	837	837
Freight revenue .....	\$8,094,107	\$7,731,118
Passenger revenue .....	1,513,168	1,410,618
Total operating revenue.....	10,583,630	10,035,896
Maintenance of way and structures.....	1,132,086	1,132,078
Maintenance of equipment.....	1,277,530	1,185,016
Traffic expenses .....	334,668	336,196
Transportation expenses .....	3,298,504	3,397,007
General expenses .....	410,184	489,087
Total operating expenses.....	6,361,722	6,478,821
Taxes .....	561,990	574,316
Operating income .....	3,659,918	2,982,759
Gross income .....	3,857,676	3,159,530
Net income .....	1,718,468	1,131,083
Dividends .....	840,000	840,000
Surplus .....	878,468	291,083

### CHICAGO, ROCK ISLAND & PACIFIC

IT is unfortunate that the Chicago, Rock Island & Pacific is not in a position to raise all of the capital needed for physical improvements, but the report of the receiver for the last fiscal year shows that much is being accomplished by the expenditure of surplus current funds. A share in the general prosperity of the country, combined with effective operating economies, made quite a large sum available to the receiver for additions and betterments. For his guidance in the expenditure of this sum he had a report made by J. W. Kendrick, formerly vice-president of the Atchison, Topeka & Santa Fe and associates; a review of this report by Major Charles Hine, and exhaustive comments on the Kendrick report and Hine's review of it by the Rock Island chief operating officer, general solicitor, freight traffic manager, comptroller, general purchasing agent and assistant to receiver. The Kendrick report had advocated the expenditure of approximately \$33,000,000 over a period of three years. The receiver had available and actually used \$4,718,000 for additions and betterments.

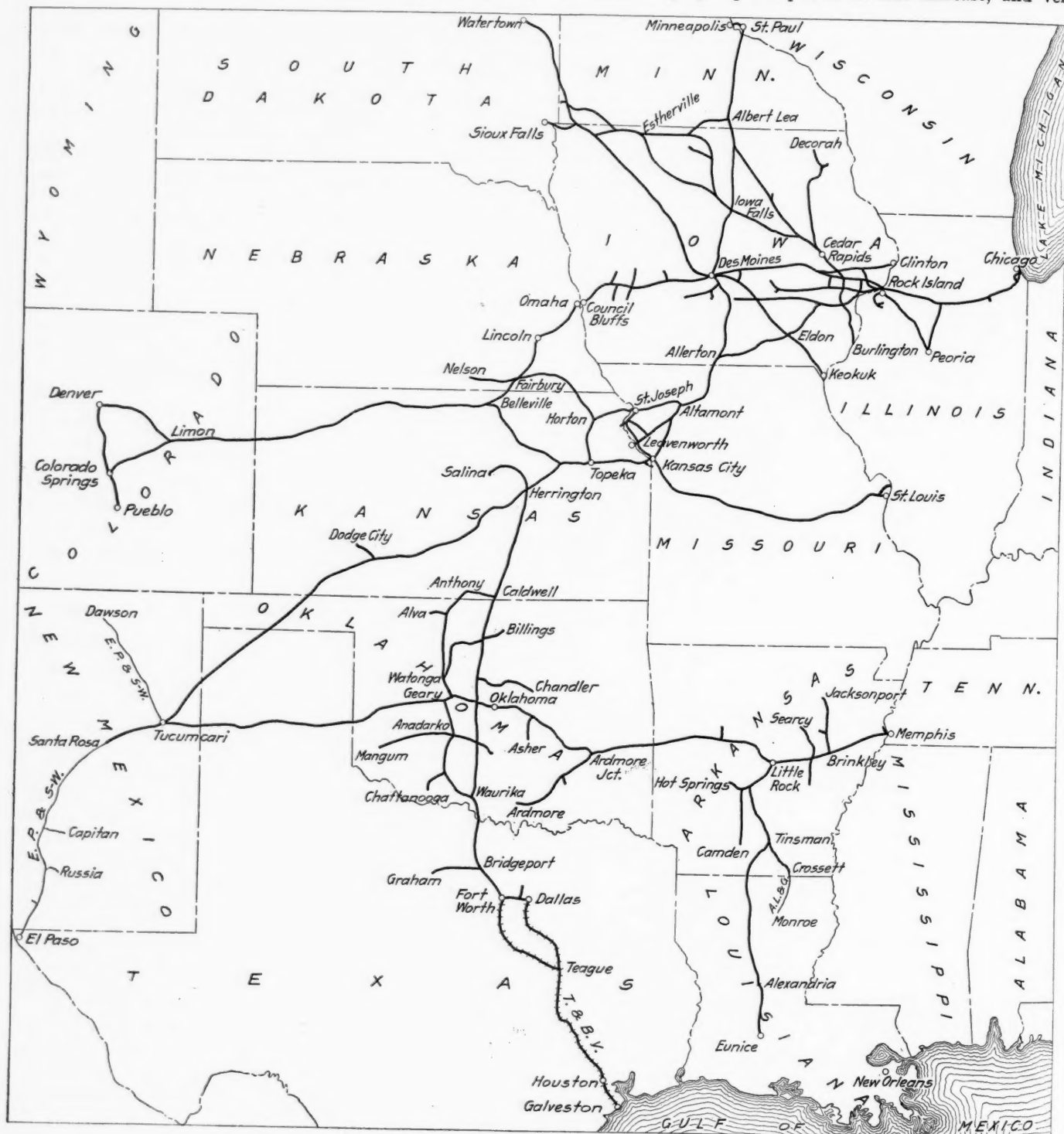
Besides being limited as to a complete adoption of the recommendations of the Kendrick report by lack of capital, the receiver relied on his own judgment and the advice of his officers in departing from the program outlined by the experts. A touch of humor is lent to what is in general a sober analysis of the progress made, by the statement that the experts' report estimated an annual saving of \$200,000 in the elimination of stock claims by the expenditure of \$309,348 for fences; but "inasmuch as in only two years of the Rock Island's history had the annual expenditures for stock claims aggregated \$200,000, the average for 10 years being \$169,675, it is hardly possible to effect an annual saving of \$200,000 per year in the amount paid in stock claims." In the great majority of cases the recommendations in the experts' report were followed in general, if not in detail, as far as available funds permitted.

The Rock Island made a very good showing in the fiscal year ended June 30, 1916, as is made obvious by a surplus, after making charges for all rentals and interest, of \$2,957,000, comparing with a deficit in 1915 of \$735,000. The study

of the operation of the property made by the experts and the adoption of many of their recommendations was instrumental in obtaining these results, but great importance also must be attached to the concluding paragraph of the report of the receiver:

"The receiver heartily commends the loyal and able

ly disposition for and confidence in its local representatives. While the gratifying showing made during the fiscal year was mainly attributable to the general prosperity and increase of the business of the country, it is manifest that it required constant vigilance, loyalty, activity and satisfactory service to secure a proper participation in that increase, and very



The Chicago, Rock Island & Pacific

service of the officials and employees under him. So far from a receivership making them lax and perfunctory in the discharge of their duties it has stimulated them to greater zeal. A sense of trusteeship has made them co-operate toward rehabilitating the properties and restoring their management to their owners. In going over the properties and coming in contact with the patrons, chambers of commerce and public officials, the receiver has found a manifestation of deep interest and friendship for the Rock Island Lines and a friend-

high efficiency in all departments to realize therefrom the net results obtained."

Total operating revenues in 1916 amounted to \$75,347,000, an increase\* over 1915 of \$4,399,000, or 6.20 per cent. Total operating expenses amounted to \$54,543,000, an in-

\*The actual increase was greater than this because the 1916 earnings do not include the operation of the Keokuk & Des Moines, about 232 miles, whereas the 1915 figures do include the operation of this road. Except where specifically stated, all of the comparisons made in these comments are subject to this correction.

crease of \$1,022,000, or 1.91 per cent. This increase in operating expenses was the result of an expenditure of \$10,518,000 for maintenance of way, or \$1,049,000 more than was spent on maintenance of way in 1915, and \$12,648,000 for maintenance of equipment, which was \$841,000 more than was spent on maintenance of equipment in 1915, offset in part by a transportation cost of \$27,225,000, a saving as compared with 1915 of \$916,000. The largest single item of saving was that in cost of fuel for locomotives. Treating the Keokuk & Des Moines as if still operated by the Rock Island so as to make an accurate comparison, there was a saving of over \$300,000 in the cost of fuel, in the face of an increase in the ton mileage carried and almost no decrease in the passenger mileage. In part this saving was the result of a reduction in locomotive mileage, due to the elimination of unprofitable passenger trains. In part it is estimated that it was the result of carrying out the Kendrick report's suggestion of organizing a fuel department under the supervision of a manager of mining and fuel. This officer reported, however, to the chief operating officer and not, as was recommended in the Kendrick report, to the purchasing and stores department.

More striking, even, than the saving made in fuel was the reduction in payments for loss and damage to freight. Such payments in 1916 amounted to \$879,000, which was \$282,000, or 24.28 per cent less than the payments in 1915. The saving, if a strictly accurate comparison were made which would include the Keokuk & Des Moines, in 1916 was over 31 per cent. The Rock Island had in operation for the greater part of the 1916 year 4,000 new box cars, and besides this, old box cars were maintained in better repair in 1916 than in 1915. The primary cause, however, the receiver thinks, of the large saving made was in the increased attention given to the entire subject of operation, including not only better equipment but also better track, better freight house operation, better loading and better organization. A supervisor of freight house operation was appointed in February, 1916, and the drop truck system recommended in the Kendrick report was adopted, and of the 1,465 trucks authorized to be bought, about one-third were put in operation. It is estimated that the cost per ton of handling l. c. freight in 1916 was 37.59 cents, and in 1915 37.99 cents, notwithstanding an increased wage schedule in effect in 1916.

Total freight train mileage was 16,371,000 in 1916, an increase of less than half of 1 per cent, and the number of tons of all freight moved one mile was 6,914,000,000, an increase of 7.03 per cent. The average trainload of all freight was 406 tons in 1916 as against 380 tons in 1915.

The total passenger train mileage was 17,433,000 in 1916, a decrease of 607,000, or 3.37 per cent. The passenger mileage was 953,000,000, or only a fraction of 1 per cent less than in 1915. The Kendrick report had recommended a quite drastic cutting down of passenger service and, among other things, the abandonment of the Rock Island-Southern Pacific's Golden State Limited. The receiver and his operating officers, however, decided that although this train did not pay when charged with its full share of overhead as well as out of pocket cost, its earnings were more than sufficient to pay actual expenses of operation, and it was, therefore, profitable to continue it. The state commissions prevented the abandonment of some local trains that were obviously being operated at a considerable dead loss, and in other cases the pressure of public opinion prevented the carrying out of the program of curtailment.

There was a total of \$2,680,000 spent for additions and betterments to road, entailing, in many cases, increased expenditures for maintenance of way. It is interesting to note that the Kendrick report had recommended the purchase of 880 motor cars at a cost of \$176,000 for the use of section gangs. The receiver decided to buy 759 motor cars for section gangs and 95 for bridge gangs and his estimates of the

probable saving are approximately the same as that of Mr. Kendrick—\$450,000 a year.

The Chicago, Rock Island & Pacific had been operated until December, 1915, in three districts, each in charge of a general manager. These three districts were combined to form two general managers' districts, and the direct saving in salaries and expenses is about \$75,000 a year. It is, of course, too early to estimate whether there will also be indirect savings or indirect losses. Another change which should be mentioned is the reorganization of the signal department and the purchase of 18 motor cars for use by this department. An estimated saving as the result of these changes is being made of about \$20,000 a year.

The table at the end of these comments shows charges made to income for all of the interest due on outstanding securities. As a matter of fact, however, the receiver was instructed not to pay the interest on the \$20,000,000 5 per cent debentures and certain other interest, a total of \$1,607,000 for the year, which, although shown as subtracted from income, was not actually paid. At the end of the year the company had on hand \$3,468,000 cash and \$2,483,000 special deposits. There are \$4,100,000 loans and bills payable, interest on which the receiver has assumed. It is worth noting that the audited accounts and wages unpaid have been reduced from \$6,673,000 at the end of 1915 to \$5,505,000 at the end of 1916.

The table below shows principal figures for 1916 and 1915:

	1916.	1915.
Average mileage operated.....	8,098	8,330
Freight revenue .....	\$50,921,932	\$47,576,668
Passenger revenue .....	18,664,963	18,230,101
Total operating revenue.....	75,346,967	70,947,890
Maintenance of way and structures.....	10,518,065	9,468,978
Maintenance of equipment.....	12,648,260	11,807,657
Traffic expenses .....	1,745,573	1,877,152
Transportation expenses .....	27,224,633	28,139,317
General expenses .....	1,941,877	1,763,925
Total operating expenses.....	54,543,133	53,521,615
Taxes .....	3,567,851	3,353,919
Operating income .....	17,204,726	14,039,895
Gross income .....	18,611,068	15,407,811
Net income .....	2,957,281	734,677*

\*Deficit.

## NEW BOOKS

*Handbook of Rock Excavation.* By Halbert P. Gillette. 809 pages, 200 illustrations, 4¼ in. by 7 in. Bound in leather. Published by the Clark Book Co., New York. Price \$5.

The author of this book has done much to create a proper realization of the value of cost data among engineers and contractors by his numerous writings on this subject. Entering the field of cost data a few years ago when relatively little had been written on this subject he has collected and made available for use a vast amount of information of this character which is of value to men engaged in construction work. This book and a companion book on Earth Excavation which will soon appear add much data to that already made public.

The present volume contains most of the information originally published 12 years ago in "Rock Excavation, Methods and Cost," together with twice as much new material which has been collected since that time. Accompanying the cost data are descriptions of a large number of methods of excavating and transporting rock under different conditions which give a reader the proper surroundings to enable him to analyze and interpret the figures. Considerable space is also given to descriptions of drills and other rock handling equipment required in work of this character.

The subjects of the chapters are as follows: Rocks and Their Properties; Methods and Cost of Hand Drilling; Drill Bits; Shape, Sharpening and Tempering; Machine Drills and Their Use; Core Drills; Explosives; Charging and Firing; Methods of Blasting; Loading and Transporting Rock; Quarrying Dimension Stone; Open Cut Excavation in Rubble Quarries, Pits and Mines; Railroad Rock Excavation and Boulder Blasting; Canal Excavation; Trench Work; Subaqueous Rock Excavation.

# Opportunity and Responsibility of the Railroad Man\*

Lessons Railroad Men May Learn from Banking Situation of Twenty Years Ago and Development Since

By Frank A. Vanderlip

President of the National City Bank, New York.

AS the financial executives of the railroads of the United States, you naturally have a good deal of pride in your business. You know that you represent an interest which is capitalized for more than \$16,000,000,000. You know that a great amount of new capital ought to be going into that business every year, and it has appeared that a good deal has been going into it. You have seen American investors buy back from foreign holders \$1,600,000,000 of railroad securities since the outbreak of the European war. You may take pride in the fact that our investors have shown such confidence as to buy back this great amount of railroad securities. But if you have any disposition to feel that your business is popular with investors, you may as well put that out of your minds. Do not feel proud of your popularity with investors.

We have been talking in billions about the capital invested in the business; in billions about the amount of railroad securities that investors have repurchased, but do you know that in the year 1915 the total amount of money put into new railroad stock for new railroad work was \$12,950,000? Investors will loan you money, at least those of you who represent corporations that still can make a mortgage that offers security, but investors will not even loan the railroads money to anything like the extent of their financial needs. When it comes to new money going into fresh partnership with the railroads, when it comes to raising fresh capital by stock issues, your lack of popularity with the investor is shown in its true light.

Even in their efforts to borrow, the railroads have for several years had to resort to short term investments. Most of the financing for several years was done in that way, and most of the recent financing has been the refunding of maturing short term obligations, but there is no new money to take new stock issues. You still have some credit; you can borrow, but your business is without the confidence of the investor. It is a sad outlook for the biggest single business in America when that business no longer has the confidence of the investors, and will not stand the test of bringing new dollars for stock investment for the further development of railroad properties.

A few weeks ago when the President of the United States was discussing with the union labor leaders the suggestion of forced arbitration, he was told with a good deal of ringing pride that "Men cannot be subjected to involuntary servitude." Do you know you cannot subject an uninvested dollar to involuntary servitude either? The railroad business affords the best illustration of that. Fresh dollars decline to be subjected to involuntary servitude in new railroad stock investment; these dollars are going somewhere else.

There has within a year been invested \$400,000,000 in new industrials in America, but practically not a dollar for railroad investment. The only new capital the railroads have obtained has been through borrowing. There are many phases of the railroad situation that are not heartening. We see forty-two thousand miles of railroads in the hands of the receivers, represented by \$2,250,000,000 of securities.

And yet on top of that we have seen Congress take the extraordinary responsibility of advancing the wages of rail-

road trainmen. The extent of the railroad business is such that we ought to be building 200,000 freight cars a year. Last year we built 74,000; this year the orders up to date are for 60,000. The effect of this is sharply pointed out in last week's report of a car shortage aggregating 87,000 cars.

I could use figures to illustrate the position of the railroads without end, but you know these figures better than I do. I remember E. P. Ripley saying one time after a discussion about leasing a railroad, a discussion that had grown too statistical: "Let us throw the figures away and get down to business." I do not want to make a statistical speech, so we will throw away the figures and take up some of the fundamental considerations of the railroad situation.

I saw a letter the other day from Mr. Thornton from England. Some of you know Mr. Thornton. He is a very eminent American railroad man who went into the English service, and has been chosen by the British government as one of the small group of men in charge of the operation of British railroads. In that letter he told why the German army did not reach Paris, after that wonderful start, after smashing through Belgium, and after getting so near that the sound of the guns could be heard in Paris, and before Great Britain could gather herself for the attack. This letter told the reason, and the reason was the railroad. The railroad service broke down under the pressure, could not stand the strain, was not up to the enormous requirements. If the service had been fully up to the requirements, it would have changed the history of the war—in that particular case, I believe, for the worse. But that is neither here nor there. It illustrates the importance to the nation of preparedness of its railroads.

## HARDENING OF ARTERIES

Most of us have reached an age where we find ourselves once in a while in a doctor's office with our coat off and a rubber bandage around our arm. A doctor is taking our blood pressure. It is high time to take the blood pressure of the United States. I tell you you will find that the United States is getting hardening of the arteries, and it is a very dangerous disease.

We have hampered the railroads by such restrictions, such interference, such an unfriendly attitude by the public, by commissions, by legislators, that investors have been afraid to give to the railroads the fresh capital, by the use of which they could alone maintain the resiliency enabling them to meet extraordinary demands. This lack of new capital has put many railroads in a position where they cannot meet the demands of excessive business pressure. We are seeing that in the situation today. But there might come demands far more severe than anything that business is putting on the railroads at the moment.

Just as certainly as a man with hardened arteries is in vital danger should he engage in some struggle that calls forth all his powers, so the United States would be in danger from its hardened arteries of transportation if the nation ever faced a struggle. That danger would be one of enormous consequences. I believe that the situation ought to be regarded by our statesmen—such as we have—and by our people—if they think—as a matter of grave national concern. Do not be confused because of the fact that we have bought back \$1,600,000,000 of securities from foreign hold-

\*An address before the Society of Railway Financial Officers at Washington, October 20, 1916.

ers. Even that vast repurchase of securities does not show confidence in the railroad situation. It shows confidence in the old secured debts which have been in the hands of foreign holders. It is quite possible to have a satisfactory mortgage on a very poor business. Railroads can still operate and they can and do go on increasing their debts, but it is a fact that investors are not attracted to new capital stock investment, and it is a dangerous fact that the development of the railroads has been retarded because capital does not regard the field as satisfactory. There is a lack of sympathy between the railroads and the public; there is a lack of confidence in the minds of investors, and it is well to remember, too, that investors are now having new opportunities such as have rarely, if ever, been offered to the investing public. American investors have bought since the outbreak of the war, \$1,700,000,000 of foreign government securities. You will see that total grow rapidly. The greatest nations of the earth are paying more for money than first-class railroads have paid in a long time. The foreign demand for capital will increase in capacity rather than decrease. You will have to meet this new competition. The railroads will have to face not only the difficulties that they have faced in the past, but they will have to face a new set of difficulties. They will have the difficulty of being in a world where untold wealth has been destroyed; a world where the competition for capital will make the price of capital high; a world where the United States has entered at last financially as a real world factor. In our markets will come the play of competition, of a world demand for investment funds, and the railroads must meet all that in addition to the difficulties inherent in their position, which lead to a lack of fundamental confidence.

#### WHAT IS THE TROUBLE?

What is the trouble with us? What is the matter? I do not believe there is a man in this room who knows what is the matter, or who has really gotten down to thorough thinking, in a nation wide way, as to what is the matter. This railroad situation seems to me to be quite parallel, in some ways, to the banking situation twenty years ago. America, with its insular business, its system of individual banks, had not developed bankers who thought either nationally or internationally. They thought of the business that passed over their desks. They were sound money lenders, but they had not learned much about the business of banking as a science.

But they began to see that something very serious was the matter. We had recurrences of panics. Twenty years ago, you will remember, we were talking in a more or less loose way about the need for an expanding currency. That seemed to be the catch word. But few men understood the principles or the economics of the banking business. They saw something was wrong, they were groping, but there was no unity of opinion whatever. No two bankers would have made the same diagnosis or given the same prescription as to what should be done.

But the great difficulties, and the great losses that followed the difficulties, made men think. They—the whole banking fraternity—got it pretty well into their minds, that there was something wrong, and that a remedy had to be found. Men began to devote their minds to it, and that was not confined to the men in the big centers, either. There were more men, I believe, in small communities, with the time, the temperament, and the inclination to study, who contributed to the solution of that problem than could be found in the very busy offices in the great centers.

After a while certain principles began to crystallize in the minds of the bankers, but until that was done it was perfectly idle to talk about getting legislation that would be correct from an economic point of view. Until there was a body of banking opinion which was in agreement and saw clearly, which had studied the principles, which knew that

we have got to mobilize our resources, which knew we ought to have in circulation bank note currency, which knew there needed to be a central bank—and that is what the banking mind knew we needed—until there was that crystallization in the banking mind, there was no progress in the confidence of the public or legislators as to what should be done. When that opinion crystallized something was done, and it was done in the right direction. I am merely using this as an illustration. What was done has been only one step, and there have got to be some others.

#### RAILROAD MEN MUST BE STATESMEN

What I want to do is to use this as an illustration of the necessity for railroad men to think of their subject nationally, and to begin to see that there is something fundamentally wrong with our railroad situation; that the trouble is not merely with the administration of the interstate commerce law, or with that law itself; the trouble is not altogether with the hampers that various state commissions put upon you; that the trouble is not wholly that of lack of sympathy on the part of the public with your problems. You have got to get at this thing so that you think as statesmen, that you see a great economic and national problem.

I am not assuming to tell you what the answer is at all. I have not thought of it sufficiently. I do not believe there is a man in this room who has thought of it sufficiently. We have got to direct the expert railroad sentiment to the question "what is the trouble." You have got to diagnose your disease before you attempt to cure it.

You have in your Committee of Railroad Executives a starting point. They say they want federal incorporation, want to abolish state control, want to have regional sub-commissions, patterned somewhat on the Federal Reserve Bank. That is a start.

I have talked to some of them about some other features of the situation that seemed to me just as fundamental, and they answer, "Don't load the wagon so heavily; it will not start." That may be true; probably you can not do everything that should be done at once. But you can think about it, you can think about it clearly and intelligently, until all of your minds crystallize, until the great body of railroad opinion crystallizes, so that we have a force of expert opinion that will begin to tell on general public opinion and then on legislation.

Now, this idea that you are going to be happy after you merely get rid of state control, I doubt. It is a move in the right direction, but remember you were not happy before you had state control.

We have, it seems to me, two perfectly incongruous ideas in our administration of this great business—first, there is the theory of regulation, regulation that is getting enormously onerous; regulation that calls for two million reports a year and prescribes every detail of the operations covered by those reports; regulation that not only fixes your rates and fixes a great part of your administration, but now regulates the wages you pay, and regulates them because of threatened strikes, not because of relative levels.

Then we adopt, parallel with this theory of regulation, the same restricted legislation prohibiting combinations that we have applied to all competitive business. Side by side with the theory of regulation, we apply this other theory and apply it with all the vigor that we do to uncontrolled competitive business; thus you are caught between two mill stones. You cannot obtain the economies in operation which a proper understanding and co-operation between railroad properties would evolve. You are estopped by one theory from obtaining the economies of combination, and, at the same time, you are grasped by the other theory and left with no freedom of competition. Is it any wonder that you are not securing money from investors for new development in a field of business so hampered? Is it surprising that we saw last year the

smallest amount of railroad construction in any year since the Civil War? Is it not a natural consequence that you cannot get money enough properly to equip your roads and to enable you satisfactorily to do your business?

What this situation needs, it seems to me, is railroad men who are statesmen. That was what the banking business needed. It was hard to find them, and it took years of severe trials to grow bankers with statesmanlike vision. You railroad men are busy with your day's work just as the bankers were; you are engrossed in the great flow of business that goes over your desks, with the normal natural problems of the day's work, and with the abnormal unnatural problems that have been put upon railroad managements by unsound public opinion and legislation. But it seems to me, and I hope I am not too critical, that you are in just the position in which we found the bankers twenty years ago—too busy to think nationally, too near to detail to really be statesmen, and to keenly study the matter as a problem in economics, a problem in government, and a problem in finance. The subject is one that railroad men must approach in a broad way. They must no longer view it as the individual problem of each road, but must study it in the light of the experience of other countries, in the light of our political institutions, and with a view to bringing about a sound state of public opinion.

#### GOVERNMENT OWNERSHIP A TRAGEDY

That is what has got to be done. It is certain we will not solve the railroad problem at all until you railroad men have reached some substantial agreement as to at least certain common principles which must be involved in solving it. Since I have been in this room men have said to me, "Well, I suppose we are going inevitably to public ownership." If we are, we are going inevitably to a public tragedy.

We are going inevitably somewhere. We are not going to stand still with railroads unprovided with funds, with hostile government supervision, with laws that prevent economic combinations, with a selfish public demanding lower and lower rates, and selfish labor forces demanding higher and higher wages. You are going somewhere; you are not going to stand still. Something has got to be done, and it is up to you to have a pretty clear opinion of what it is that ought to be done, because we have to look to railroad men for expert railroad opinion.

We get all sorts of criticisms about maladministration in the financial management of the railroads. A lot of that criticism is unfair, a lot of it is demagogic, and some of it is true. But what of it? At the most, taking everything that is criticized in the way of the financial administration or maladministration of railroads, it would not apply to ten per cent of the whole railroad field. How would our government officials like to be judged by the worst ten per cent of their performances?

Some things have been done that ought not to have been done. But that does not mean that the way to cure it all is to have government ownership and government operation. Nor does it mean that the way to cure it all is to have a blind government control that has no regard for the safety of the investment and creates a situation where investors will no longer put their money into the properties.

#### TROUBLES ARE FUNDAMENTAL

The real trouble is a good deal deeper than any questions of existing legislation. The real cure is a good deal deeper than any new methods of regulation. It seems to me that the troubles are really fundamental; they are troubles fundamental to our national character, and that means fundamental to individual character.

There is a selfishness in this railroad proposition. The public is selfish about rates; labor is selfish about wages; investors, if you will, are selfish about returns; politicians are

selfish about holding place. All selfishness is short sighted, but there can be no better examples, it seems to me, of short sighted selfishness than these lines of selfishness that I have enumerated.

There is the selfishness of the shipper who always wants a little lower rate. A man told me it costs 32 cents to pay the freight from New York to San Francisco on an entire outfit of clothes a man wears. That is not a very heavy tax. If men would analyze what that tax of freight means to them, they would see what an infinitesimal thing it is to give the railroad fair rates, and what a great thing it is for the nation not alone to have prosperous railroads, but to have efficient railroads, to have railroads that are up to the highest standard of service—and after all, that is what we want, and it would seem they certainly would be willing to pay for it. If we took a broad view of the matter we would cure some of the selfishness.

So, it is up to you to do what you can all the time to show to the public what selfishness really entails, not only on the railroad, but on them. I do not believe you are doing that, and I do not believe any railroad company begins to do it as it should be done. It is up to the railroads to show the public how much better off it would be if the railroads were fairly treated, so they could render efficient service under all circumstances, and be prepared to render efficient service in all emergencies.

#### THE SELFISHNESS OF LABOR

Then there is the selfishness of labor. Much of it really has its foundation in ignorance. I have a copy of a paper which came to my desk yesterday, which was really one of the most shocking publications I have seen in a great while. It is the weekly organ of some branch of railroad laborers, published in Cleveland. There was set forth in that paper detailed instructions to railroad men how to injure railroad property. The car repairer is told to insert a broken bolt when he is repairing a car. He is told in detail just how to insert the broken bolt so that when the car is on the road and gets a heavy strain it will pull out again, the train will be delayed, the car will have to go back for further repairs, and the whole incident will lead to more work and shorter hours.

This paper tells the helper of the mechanic making repairs on engines how to place a jack so it will fall out before it is ready to do its full service, and the work would have to be done over again. It suggests that when he is sent after a tool he should get the wrong tool, and keep the man he is working with waiting. The switchman is instructed how to run a car on to a frog and delay the train and make more work. There are detailed instructions of this kind all through the various fields of railroad labor, telling men how to destroy.

Could there be more dangerous selfishness than that? Could there be greater economic ignorance, worse economic blindness than for men to so completely fail to see that there is a unity in society, that there is a necessity that we all contribute, that none of us be shirkers if all society is to produce (and the production of things is what society is organized for)? There is one of the great problems of the day. What is there more important than to make men see that there is truly a unity between capital and labor, that there is truly a unity between all members of society, that we must not send a man out to do our work with a dull ax. We must give him a good tool and then when he goes to work he must not be a shirker, because shirkers will mean decreased production, and decreased production means fewer things for the people—all that is fundamental economic law.

You may at once reply, "Yes, and so are your stockholders selfish." They are, probably. They are at least free in a competitive market, and if you can call it selfishness to take an investment which they believe more secure

and in which the promise of return is higher, instead of taking one they believe is less secure, and where the promise of return is small, they are selfish, too. But that is a selfishness against which it will be harder to advance sound reasons than the selfishness of the employee who puts out rules of sabotage.

The meanest selfishness of all is the selfishness of the politician, who will trade what he knows is sound reason and judgment for place and votes. A man who will sell his vote for money is not a whit worse than the man who will sell his executive judgment for votes. That is the meanest selfishness of all.

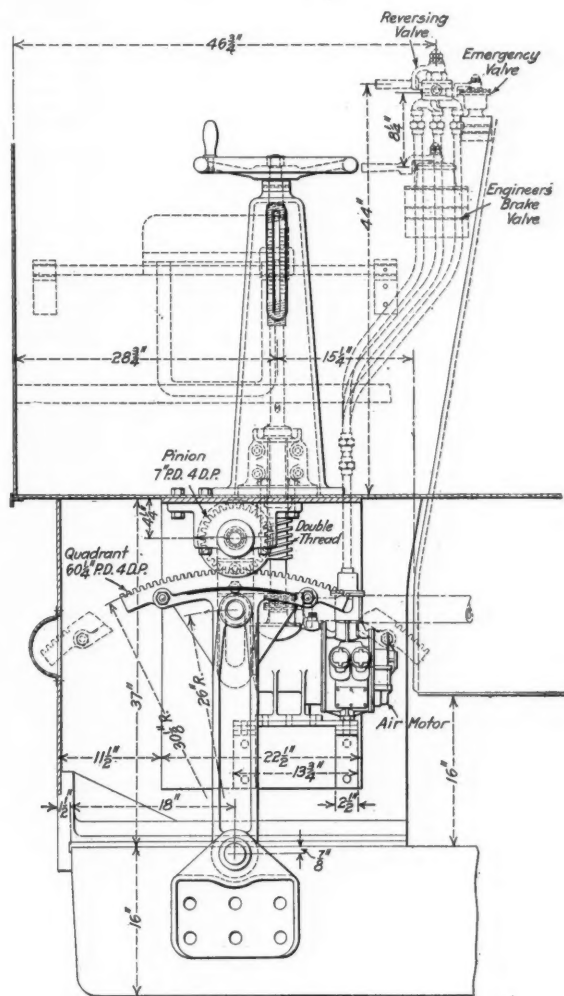
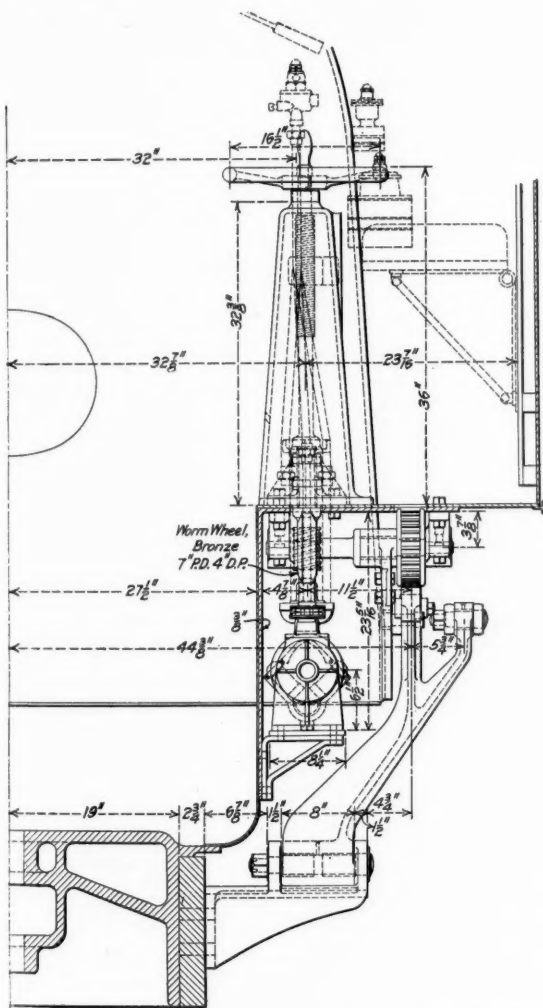
## MORAL PREPAREDNESS

What does it all sum up to? Do you not see it is deeper than national incorporation, and it is deeper than the action of the Interstate Commerce Commission? Do you not see that it is really a fundamental principle of intelligent citizenship, of patriotic, unselfish citizenship? That is the test of any real cure. That is what we have got to have, it seems to me, if we are to have anything like the preparedness we

going to have the moral strength and fibre to form right judgments, that is going to have the moral strength and fibre to undergo any sacrifice to uphold right judgments, that is going to have the moral courage not to temporize, not to trade for momentary advantage. We need a moral preparedness that will give us in the end a public opinion which will demand from the Government sound economic legislation, which will demand from labor a recognition of its proper duties and responsibilities, and which will demand from capital fair and honest co-operation in its relation to employees and to the public, and for capital a just participation in the success of business.

## LOCOMOTIVE POWER REVERSE GEAR

An ingenious power reverse gear for use on locomotives has been invented by M. F. Cox, assistant superintendent of machinery, Louisville & Nashville, and is in use on the eight-wheel switching engines recently built by that road. This gear consists of a vertical shaft the lower end of which contains an integral worm that meshes with a bronze worm



## Power Reverse Gear Developed on the Louisville & Nashville

should have for the work that is ahead of us, and the competition that is ahead of us in this country.

We need a physical preparedness. We need a preparedness in a military way, if you will—I believe we do, far beyond anything we have got—we need preparedness in industry, and most certainly we need preparedness of the arteries that carry the life blood of the country. But above all, we need a moral preparedness that is going to see things as they are, clearly, guided by right economic thought, that is

wheel located on a short horizontal shaft. On the opposite end of the horizontal shaft is a shrouded steel pinion meshing with a segment of a steel gear. This segment and the reach rod connection form one forked steel casting fulcrumed at the bottom to a substantial bracket and steel pin. This device may be operated either by hand or other power. The illustration shows the gear arranged for operation by an air motor the main spindle of which is connected at the base of the vertical worm shaft above mentioned by means of a

flexible coupling. The motor is controlled and operated by a two-way valve conveniently attached to the boiler head within easy reach of the engineer and so arranged that the handle will be moved left to right for the forward movement of the engine, and the opposite direction for the backward movement. The wheel shown at the top of the vertical shaft is only used when it is desired to reverse by hand. It is readily removed and may be stowed away when the gear is being operated by power. The upper portion of the vertical shaft is threaded and fitted with an indicator nut which shows the engineer at a glance the length of cut-off at which the engine is running. The scale for this indicator or pointer is located in full view on the outside of the reverse gear housing. This feature, of course, is of greater importance on road engines as switches seldom, if ever, operate except in the corners. It requires 14 revolutions of the vertical shaft to bring the engine from full gear forward to full gear backward. With the air motor and 45 to 50 lb. air pressure, this can be accomplished in a few seconds. Its operation is smooth and noiseless. Its advantages are recognized over the old method often requiring 100 to 150 reversals during the course of a day and the attention of the engineer diverted from the tracks, while struggling to reverse a heavy, stiff gear.

Patent for this gear is now pending.

### A THREATENED COAL FAMINE

The summary of car shortages and surpluses for September 30, the last issued by the American Railway Association, showed a net shortage 61,031 cars of which 19,872, or nearly one-third, were coal cars, and the shortage of coal cars has been steadily growing more acute since that time. Twenty-six coal companies on the Chicago & Eastern Illinois and the Chicago, Terre Haute & Southeastern have filed application in the United States District Court in Chicago for an injunction to force 142 railroads, named in the bill, to return coal cars of the C. & E. I. and the C. T. H. & S. E. for the use of mines along these roads. The bill alleges that the mines have an aggregate daily capacity of 27,000 tons and that although they could sell that amount of coal if supplied with cars, they have been able to secure sufficient cars during the past month to load an average of only 17,000 tons daily. A large operator in Illinois states that his mines were worked only 79 per cent of the working days in October, although they might have been worked full time and over-time if cars had been furnished. It is reported on good authority that coal mines in West Virginia, Pennsylvania and Ohio are operating at half-time and less.

Unusual as it may seem, in view of the above, the railroads have been carrying as much, or more coal than a year ago, in many cases with less than their normal equipment. One mid-western road which had on its line on October 15, only 17,000 coal cars, including foreign cars, out of 25,000 owned, showed an increase in the tonnage of coal hauled over a year ago of 38.9 per cent in August, 16.5 per cent in September, and 5 per cent in October. Another road in the same section of the country which has on its line but 10,000 coal cars, as compared with 16,000 owned, handled practically the same amount of coal traffic it did in 1915. A western road with 6 per cent less than its normal coal-carrying equipment increased its coal loading over a year ago, 27 per cent in August, 6 per cent in September and 17 per cent in October. A large road operating in the heart of the eastern coal fields, handled shipments of bituminous coal to the extent of 36,000,000 tons during the first nine months of this year as compared with 31,000,000 tons during the same period in 1915. Coke shipments for the same period were 10,850,000 tons in 1916, and 8,376,000 in 1915; whereas shipments of anthracite were 8,800,000 tons in 1916, and 7,600,000 in 1915.

Despite the fact that the carriers are hauling as much coal as a year ago, there is a growing scarcity of fuel throughout the country. The price of soft coal has increased over 300 per cent above the price a year ago in some places, while anthracite coal has been selling at \$9.50 a ton in Chicago and \$12.00 in Cleveland. Reports from most of the large cities of the country indicate that industrial plants have only a hand-to-mouth supply of coal on hand. The diminishing supply of fuel has become so alarming in Ohio that the city of Columbus has established a municipal coal yard for the purpose of securing fuel for its population, and Cleveland is considering the adoption of similar measures. The municipal electric light and power plant at Detroit would have been forced to shut down recently but for the timely arrival of Illinois coal, which ordinarily rarely reaches that market.

The common explanation of the shortage of coal is that industrial activity has increased much faster during the past year than the production of coal and additional coal-carrying equipment. Eastern steam coal no longer moves to western markets but is shipped farther east to industrial plants. The fact that Illinois coal is being shipped to Ohio, and as far east as Buffalo, is indicative of the situation. Because of the great profitableness of moving ore, lake boats which, in former years, carried eastern coal to the head of the lakes, have been making the return trip empty to save time during the past season. As a result, Illinois coal is now being shipped to St. Paul, which was formerly supplied almost entirely from Duluth and Superior. It is also noteworthy that shipments of coal from the Pittsburgh district south on the Ohio river have decreased because of low water.

The State Public Utilities Commission of Illinois has ordered all its inspectors to visit the coal mines in the state, to check up the use of coal cars for carrying other freight and to do everything possible to increase the supply of coal in Chicago and the other Illinois cities. The Interstate Commerce Commission has been holding hearings at Louisville, Ky., on the question of the general car shortage in which due attention will probably be paid to the coal situation.

Many railroads have taken extraordinary measures to conserve coal car equipment for their own lines. The Chicago, Burlington & Quincy, the Illinois Central and the Chicago & Alton have placed embargoes on shipments of coal in company-owned equipment east of the Chicago switching district. The Chicago & Eastern Illinois has placed an embargo on the movement of its coal cars to unusual destinations east of Chicago. The Louisville & Nashville has declared an embargo against the moving of its coal car equipment north of Cincinnati. As long ago as the middle of September the superintendent of freight transportation of the Pennsylvania Lines West addressed an appeal to the general superintendents of the company, pointing to the fact that on September 1, 55,361 of the 162,466 open cars owned by the Pennsylvania System Lines were located on foreign roads and urging company officials to take extraordinary measures to keep the remaining cars from leaving the road.

During this period the railroads are being operated more efficiently than ever before. Within the past five years the Illinois Central and the Yazoo & Mississippi Valley have increased the average car mileage per day from 28 to 40 miles, or 43 per cent. The Chicago, Burlington & Quincy moved all its equipment in September, 1916, an average of 36.5 miles per day as compared with 31.1 miles in the same month a year ago. Nevertheless some railroads in the country are now using coal cars for other than coal carrying purposes, such as the shipment of grain, automobiles and munitions. In the defense of this practice the railroads state that inasmuch as the coal mines cannot fill these cars the year round but merely in the fall and winter season, coal should have no preference over any other commodity.

# Railway Electrical Engineers' Convention

The Ninth Annual Convention Held at Chicago Was  
Marked by Record Attendance and Excellent Reports

THE ninth annual convention of the Association of Railway Electrical Engineers was held at the La Salle Hotel, Chicago, October 31 to November 3, inclusive. E. W. Jansen, electrical engineer of the Illinois Central, presided.

## CLASSIFICATION OF TECHNICAL LITERATURE

J. R. Sloan, the association's delegate on the Joint Committee on Classification of Technical Literature, presented a progress report of the joint committee. The committee is now made up of 32 delegates from technical associations in this country and is going ahead with the work of devising a standard system for the satisfactory classification of technical information. The executive committee of the joint committee has recommended that certain subjects be assigned to the different organizations most vitally interested in them, the final compilation to be performed by one central body under the supervision of an expert classifier.

## ILLUMINATION

The report of this committee was divided into four parts including (1) the result of an extensive study of the problem of properly illuminating railroad yards, (2) changes in rating of train lighting lamps and the determination of standard sizes of gas filled lamps for train lighting service, (3) a progress report on the revision of the association's incandescent lamp specifications, and (4) a brief resume of the more important developments in the incandescent lamp field.

### (1) ILLUMINATION OF RAILROAD YARDS.

The importance of having more safe and efficient operation of railroad yards at night has long been recognized, but relatively little study has been given to the subject of adequate artificial illumination that will permit operation approaching daylight conditions. The damage to rolling stock and freight at night should be materially reduced by providing ample and proper illumination.

The four general classes of yards whose efficiency can be more or less increased by proper artificial lighting are (1) classification yards, (2) reloading yards, in which freight is unloaded to the ground and transferred to other cars or boats, (3) repair yards and (4) storage yards. The committee considered each yard in the order named and recommended definite methods for the lighting of each type. In general the committee pointed out that the most economical installation of yard lighting would use poles for supporting the lighting units which would allow the units to be placed either 100 or 200 ft. apart and approximately 35 ft. in the air. The committee also decided to use the photometric curve as a proper basis upon which to make its recommendations rather than to specify the use of any particular lighting unit. The committee, therefore, included in its report an ideal curve showing minimum and maximum distribution of light from the fixture which would be required to give the illumination desired.

The chairman of the sub-committee on lighting railroad yards was H. C. Meloy, New York Central Lines.

**Discussion.** J. A. Andreucetti (C. & N. W.).—What has been done in relation to the joint conference with the American Railway Engineering Association relative to the future laying out of yards for taking care of the pole lines necessary for the illuminating system.

L. S. Billau (B. & O.).—This information is now practically completed and with such supplementary data as we may be able to secure on lighting units will no doubt be of considerable assistance to the American Railway Engineering Association committee.

C. G. Winslow (Mich. Central).—Has anything been considered along the line of providing light for signals, thus making the illumination of the semaphore sufficient to entirely do away with the signal light. There is a possibility of adding considerable value to the general yard lighting and at the same time saving the extra cost of signal lighting. In my opinion one pole-mounted light might replace three or four signals.

L. S. Billau (B. & O.).—I do not know of any case where a railroad has illuminated the signal semaphore as suggested by Mr. Winslow. The committee did not consider that phase of the question.

W. J. Davis (Am. Lighting Co.).—By placing a battery of flood lighting units at each end of the yard at a minimum height of 75 ft. and mounting them so that the beam of light would be as nearly horizontal as possible, a real flood of light would be thrown out over the yard which would give a soft, even illumination. We have found that the 1,000-watt and 750-watt lamps in the flood lighting units are satisfactory. Flood lighting, if properly installed, provides an efficient and economical system of lighting yards; it does away with the overhead system, with conduit, with poles and with excessive lamp renewals. The present systems are good, but I seriously believe that flood lighting, intelligently applied, can do the yard lighting as well, if not better, than anything previously tried.

J. L. Minick (Penn.).—The lighting of ladder tracks in a strictly classification yard becomes a matter of spot lighting each individual switch. For that reason I do not believe, from my experience, that the flood lighting unit will serve satisfactorily with that particular class of yard lighting. There are many other classes of yard service, however, where the use of a flood lighting unit would undoubtedly prove satisfactory.

G. W. Bebout (C. & O.).—How about the comparative cost of flood lighting and the series lighting system installed on steel and wooden poles?

J. L. Minick (Penn.).—In a yard at Pittsburgh, high voltage mercury-vapor lamps are installed on six 90-ft. towers. I have been told by the engineer in charge that the cost of installation runs over twice as high as the cost of the ordinary magnetite arc installation on poles and that its operating expense is also higher. One objection to the installation of towers in any yard is the fact that the layout of the yard is constantly being changed and for that reason it is highly desirable that a cheap pole construction be used which can be moved back and forth with the growth of the yard. The use of heavy steel towers is also objectionable in many cases because of the heavy permanent foundations necessary and the first cost of the towers.

J. E. Gardner (C. B. & Q.).—I have no absolute figures on the saving effected by lighting classification yards but I have been investigating hump yard lighting during the past month. I have been riding with hump riders in yards which are adequately illuminated to see just where the lights are needed and what these men would do if they did not have the lights. From this investigation I feel that the lighting of the hump in particular, not necessarily the whole classifica-

tion yard, is vitally important and I do not see how it would be possible to operate a hump with any degree of safety or efficiency if the men had to work without some kind of illumination.

#### RATING OF TRAIN LIGHTING LAMPS

The introduction of the gas filled lamps brings with it a change in the method of rating. This type of lamp should not be rated in terms of mean horizontal candlepower as this value varies greatly in lamps of the same size. It was at first intended to use the mean spherical candlepower as the basis for rating. There is serious objection to this, however, as the mean spherical value of a given lamp is usually less than its mean horizontal value and consequently purchasers are very likely to assume that the candlepower of the lamp has been reduced.

It appears advisable, therefore, to recommend that this type of lamp be rated in total lumens, the total lumens being the equivalent of the spherical candlepower multiplied by 12.57. The lumen value shall be used for inspection and test purposes only, while the lamps shall continue to be sold under and known by their wattage names. So far as the train lighting schedules are concerned, the gas-filled lamp can probably be furnished eventually in sizes from 15 watts upward for the 30-34 volt range and from 25 watts upward for the 60-65 volt range. This leaves one lamp in the 30-34 volt range, and three in the 60-65 volt range of the vacuum type which are now rated in mean horizontal candlepower, but which can be rated in total lumens equally well. It is recommended that these four lamps also be rated in total lumens so as to place all of the lamps in train lighting service on the same basis of rating. A new table or schedule for train lighting lamps was presented which gave the total lumen value for the lamps now regularly manufactured, also the proposed total lumens in accordance with the changes above outlined.

The committee thought the range of the sizes in the proposed schedule sufficient to meet all the train lighting requirements and recommended that the railroads confine their requirements to the standard sizes and types as for obvious reasons it is undesirable to develop special sizes and types of lamps to meet limited demands.

In revising the existing lamps and specifications of the association the committee desires to go on record as favoring the adoption of the following:

(1) The form of specification shall consist of two parts, one covering the general text of the specifications which is not likely to require frequent revision; the other, covering the various lamp schedules which are subject to comparatively frequent changes, should therefore be prepared in loose leaf form, supplementary to the body of specifications that will permit the ready revision of any or all of the schedules without necessity for reissuing the entire specification.

(2) The lumen as the unit of light flux shall be substituted for candlepower for lamp rating purposes. It should be understood that this does not imply that the nominal rating or name (watts or candlepower) by which the lamps are designated should necessarily be changed at the same time. Incidental to rating lamps in the terms of this unit, the lamp efficiency will be expressed in lumens per watt instead of watts per candle. The latter term as a measure of lamp efficiency is a misnomer, as it actually expresses the specific consumption of the lamp. Therefore an increase in efficiency of the lamp will now show an increase in the lumens per watt, which is a more logical and proper method of expressing efficiency than by the method employing reciprocal values. This development indicates that it will be practicable to revise this specification during the coming year to include the features mentioned above and that at the next convention a re-issue of the present specifications can be presented to the association. Developments in incandescent lamps during the

past year have been largely in the nature of refinement in manufacture resulting in improvements in quality, better uniformity of product and in some lamp sizes higher efficiency.

The committee on this subject is L. S. Billau, Baltimore & Ohio, chairman; J. A. Andreucetti, Chicago & North Western; J. E. Gardner, Chicago, Burlington & Quincy; H. C. Meloy, New York Central; J. L. Minick, Pennsylvania; D. O. Morris, Edison Lamp Works of General Electric Company; L. C. Porter, Edison Lamp Works of General Electric Company; G. O. Moores, Baltimore & Ohio; J. R. Sloan, Pennsylvania; E. W. Bender, National Lamp Works; L. C. Doane, Ivanhoe-Regent Works; W. H. Ralston, Westinghouse Lamp Company; H. Schroeder, Edison Lamp Works of the General Electric Company.

#### DATA AND INFORMATION

The report of the committee is somewhat more comprehensive and a greater number of roads are listed than in any previous report. Probably the most interesting data is that on car lighting cost. The average cost per 1,000 car miles, including all costs and all cars for the various roads, is fairly uniform and runs about two dollars. There is, however, a wide discrepancy in the values given for the cost per car month. The values given vary from \$3.88 to \$26.22. The increase in the number of electric lighted cars from 11,017 in 1911 to 20,841 in 1916 is especially interesting.

Of the motors reported, those using direct current represent 52.4 per cent in number and 47.4 per cent of total horsepower, the average horsepower of the direct current motors being 15.82. Three-phase motors constitute 39.9 per cent of the total number and 25.3 per cent of the total horsepower reported; the average horsepower of the three-phase a. c. motors is 19.8. The exact total of all motors reported this year amounts to 16,992 representing a total horsepower of 297,160, which is a considerable increase over last year's report in which 11,546 motors were listed totaling 183,777 horsepower.

*Discussion.*—E. S. M. Macnab (Can. Pac.).—The question of electric car lighting cost as shown in this report is interesting, but I would like to draw attention to some of the figures, which vary from \$3.88 per car per month up to \$26.20 per car per month. I would suggest a sub-committee of the Committee of Data and Information be appointed to investigate car lighting costs and go into the question thoroughly showing how the costs on the various railroads are compiled.

President Jansen.—When a road reports that it lights its cars for \$6 a month it is evident that there are some items that are not included. The labor would amount to more than that. Another road gives \$3.88 as the cost per car per month, which in my opinion would not cover the cost of belts alone not considering battery renewals, lamps, generator repairs or labor.

J. J. Hack (So. Pac.).—The only way to arrive at the cost of operation of electric lighted cars is to take an average over a period of five or seven years.

President Jansen.—Some roads with about 1,000 cars operate them for about \$12 a car month, others \$11; other railroads find that the cost of operating and taking care of electrical equipment on their cars amounts to \$20 per month per car. I think up to the present time if every road included all costs over a period of years, the cost per car month on account of electric lighting would be around \$20. I know the Pullman Company charges \$30.

J. R. Sloan (Penn.).—I fully agree with Mr. Hack that the cost ought to be figured over a period of years. Up to about four years ago our accumulated average was \$49.98 per car month, but after remodeling our equipment our accumulated average to date is something like \$24 per car month, which includes all the high costs of the previous

years and also includes the cost of remodeling and changing from sleeve bearings to ball bearings.

J. J. Hack (So. Pac.).—I feel that with a general run of equipment, part new and part old, if I can average \$18 or \$20 per car per month over a term of years, I am doing pretty good.

#### COMPRESSED AIR IN RAILROAD SHOPS

A check of several shop power plants showed that, not deducting for the exhaust steam, the shop air compressor consumed over 30 per cent of all the steam generated by the shop power plant. This is due to several causes:

(1) The use of compressed air has been developed for various classes of shops, so that each individual shop, round-house, and yard that makes up a group of railroad shops has its air lines and air tools.

(2) Unlike an electric transmission system a compressed air system can have a large number of leaks without causing immediate trouble other than an increased load on the air compressor. Even with careful supervision over the pipe lines there are always leaky valves developing, valves carelessly left partially open, or leaky air hose left with the pressure on it, while the compressor runs 24 hours in the day.

(3) As shop air lines are constantly being extended it is not at all unusual for the feeders to be outgrown. This is a frequent cause of complaint, the complaint usually being that the compressor is too small, whereas, in this case, the compressor is not to blame. In planning a compressed air system, it is most important to get the mains and the reservoirs large enough not only to take care of the present, but to provide for future growth.

(4) As a usual thing, the smaller shops are dependent on one air compressor alone, which requires that this compressor run 24 hours in the day and 365 days in the year. The result is that the engineer postpones any heavy repairs on the air compressor as long as he possibly can with a corresponding increase in the coal bill for which the air compressor is often not suspected.

#### ELECTRIC VERSUS PNEUMATIC PORTABLE TOOLS

Portable tools can be divided into two classes: rotating tools such as drills, motors, etc., and reciprocating tools such as riveting hammers, etc. For the reciprocating class the electric tool, in its present stage of development, seems to have no advantages over the air tool. It can merely be said that for light work there are electric tools of this type on the market. For rotating tools the following shows some of the advantages and disadvantages of the two types:

*Lightness.* The pneumatic tool is considerably lighter and consequently easier to handle than the electric tool. The increased weight of the electric drill over the pneumatic varies roughly from 10 per cent in the larger sizes to 25 per cent in the smaller. However, the electric tool has the advantage that a portable electric cord is much easier to handle than an air hose. It has also sometimes developed that two men with an electric drill will accomplish more than twice as much work as one man with a pneumatic drill.

*Efficiency.* This is the chief advantage that the electric tool has over the pneumatic. A portable pneumatic tool speeds up the instant the load is removed, thus taking more and more power as the load is released, whereas with the electric tool the exact reverse is true. On full load the efficiency of the electric drill varies from 30 per cent in the smaller sizes to as much as 80 per cent in the larger sizes, whereas the efficiency of the pneumatic tool varies from about 18 per cent to 35 per cent, depending on the size. The whole system of generation and transmission is usually more efficient in the case of electricity than in the case of air. The instant current is turned off of the electric tool the supply of

energy ceases, there are no valves, air hose, couplings and pipes to leak.

*First Cost.* The first cost of a pneumatic tool is less than that of an electric tool.

*Trouble from Freezing.* Electric tools are free from the annoyance that the air tools often give of freezing up in the winter time.

*Cost of Maintenance.* Accurate figures have not been obtained by the committee as to relative cost of maintenance of the two types of tools. Electric tools will not stand the abuse that pneumatic tools will, but where not abused it is probable that the maintenance of electric tools is considerably less than that of pneumatic.

The cost of leaks in air lines is usually greater than supposed. Tests for air leakage which was run at a shop and terminal plant in Chicago showed that the air leakage cost at the rate of \$161.40 per month, or \$1,936.80 per year. Adding 50 per cent for leakage in the air tools when the shop was in full operation, the total waste per year amounts to \$2,905.20.

#### ELECTRIC ARC WELDING

The committee presented interesting cost data which was obtained in a large locomotive shop during a period of seven months. The cost of electric power was two cents per k.w.h. The tables of cost included in the committee report showed that the average cost per locomotive for welding 2-in. flues was \$8.48; for welding 5-in. flues, \$5.39, and for welding smoke consumer tubes, \$.37. During the months of January, February, March, April, May, June and July of 1916 there were 3,392 miscellaneous jobs performed by electric welding at a total cost of \$2,966.75, which showed an estimated saving over other methods of doing the same work of \$7,939.45. In the locomotive shops 1,287 miscellaneous electric welding jobs were performed at a total cost of \$464.36, which showed a saving over other methods of doing the same work of \$1,375.18.

The committee reported that the tendency at the present time was to standardize the welding operations in the same manner that machine shop and other operations have been standardized. Where welding operations are thoroughly standardized the work can be paid for on a piecework basis. The standardization of welding operations is comparatively simple on systems which employ a supervisor of electric welding; on other roads it is more difficult, but there the necessity for having the operation standardized is greater. Ninety-five per cent of the electric arc welding done in railroad shops is on operations that can be standardized. The following factors should be determined on each job of this nature: Size of electrodes, kind of electrode, current in the arc and time required for the operation.

#### ELECTRICAL OPERATION OF RAILROAD SHOPS

Centralization of power and the operation of tools either individually or collectively by means of motors has been adopted in the various departments of practically all recently equipped railroad repair shops. The heads of the mechanical departments, appreciating the reduced operating cost and the increased output obtained through these methods, have in many instances modernized their older shops, thus eliminating the use of long lines of shafting and belt drive so far as possible. For a comparatively long time it has been the practice, in modern shops, to drive the larger machines by independent motors and group the smaller machines in such a manner as not to interfere with the operation of cranes, but the disadvantages of this arrangement, as compared with the use of independent motors exclusively, are becoming more and more appreciated, so that each year the ideal railroad shop, with all shafting and belting eliminated, becomes more nearly an accomplished fact.

In making a comparison of the two modern methods of

machine operation, it might be well to summarize the advantages of each as follows:

**Group Drive.**—Reduction of first cost of tools and motors of about 15 per cent.

**Independent Drive.**—Increased output. Saving in fuel due to the elimination of frictional losses in shafting, belting, etc. Saving in labor by obviating the necessity for shifting belts, lacing belts, repairing friction pulleys on counter-shafting, etc. Reduction in the size of power plant required by reducing frictional losses. Ability to place any machine where desired, without reference to shafting or crane locations. Increased light, due to the elimination of shafting and belting. Elimination of shafting and belting maintenance cost. The ability to operate a single machine overtime without the necessity of operating any other machine.

All motors, whether operating continuously or partially, should be looked over at least once each day by a competent man under the supervision of the Electrical Department. It should be his duty to inspect all connections, see that bearings are properly lubricated, see that brushes are properly seated, see that commutators are clean and smooth and see that motors are kept free from dust, dirt and grease. All motors should be thoroughly cleaned and if possible blown out with compressed air at regular periods, at which time air gaps should be gaged. There does not seem to be any standard rule covering this work, as each road usually works out these details according to its own ideas.

Each railroad, if possible, should maintain at least one adequate repair shop to handle electrical repairs, as the time required to transfer material to be repaired to and from outside repair shops necessitates the carrying in stock of additional spare motors, transformers, etc., to take the place of those being repaired.

In the average railroad shop, having electrically-driven machines, the cost of repairs to electrical equipment can be considerably decreased by maintaining a repair shop in which winding of armatures, field coils, and all the miscellaneous repairs in connection with the equipment can be made, instead of having them done by outside shops. For a nominal sum a shop can be equipped with all the necessary tools and apparatus for making and forming armature coils, rewinding field coils, turning down commutators, balancing and baking armatures, etc. In one instance where identical repairs were made to two machines of the same size and type, the railroad shop did a far more substantial job than the outside shop did at a cost approximately 35 per cent less. In addition to the money saving, the time saved in making repairs, and the consequent saving in loss of production are important factors in favor of an electrical repair shop. In addition to the larger repairs on motors and control apparatus the repair shop saves considerable money by refilling fuses and putting in a usable condition such material as cut-outs, switches, etc., that would otherwise be scrapped.

It has been found to require approximately six minutes per unit to thoroughly clean a 750 watt lamp and an 18-in. porcelain enameled steel reflector, from a crane trolley, this not allowing for the time necessary to move the crane to new positions. In a reasonably busy shop this must be done on overtime, and in many cases it will pay to provide a regular operator to move the crane. If the cleaner operates the crane the total cost is approximately \$.75 per unit per year for monthly cleaning. If two men are necessary this figure is raised to \$1.20 per unit. Small 200 watt units in bowl reflectors can be cleaned from a step ladder for \$.30 to \$.50 per year. From the above figures, it will be seen that the monthly cleaning is a very small per cent of the total. In the case of the 1,000 watt, gas filled unit the loss at the end of 12 months without cleaning is at the rate of \$34.00 per year, while the loss incurred during the year is approximately \$22.00. At the end of the first month the loss is at the

rate of \$9.00 per year and the loss incurred during the month \$4.50. Subtracting the \$4.50 from \$22.00 leaves \$17.50 which could be spent for monthly cleaning which costs less than \$1.00. The remaining \$16.50 is actually 1650 per cent interest on the money spent for cleaning.

In many buildings it is a good investment to keep the walls and ceilings painted white. This is especially true where the ceilings are moderately low and in building bays adjacent to the outer walls. In such places it is safe to say that the illumination may be increased 25 per cent by painting white. If sufficient illumination initially costs .8 per cent of the total wage, then 25 per cent of .8 per cent, or .2 per cent, can be expended each year for painting, this figuring the benefits to artificial lighting alone. Cold water paint is inexpensive and can be applied with relatively cheap labor. In many shops the walls and ceiling are now being painted white but not regularly, nor nearly as often as they should be. The white walls and ceiling are a part of the illuminating system. When an installation is made the color of the walls and ceilings is taken into account, but often forgotten when the system is in service. The maintenance should include all such items in money value for the specific conditions. The sub-committee is J. H. Wickman (Illinois Central), chairman; J. H. Edwards (Chicago, Rock Island & Pacific), J. H. Wright (Chicago, Burlington & Quincy), J. C. McElree (Illinois Central).

#### TRAIN LIGHTING EQUIPMENT AND PRACTICE

In addition to presenting the recommendations for standards which were submitted to the M. C. B. association at the 1916 convention, the committee presented a description of head-end train lighting practice, taking up the three different systems of lighting trains with that method—the steam head-end, the axle head-end, and the system using the head-light turbine as a head-end generator.

In regard to the axle head-end system which is extensively used by the Northern Pacific, a large capacity generator is located in the baggage car and is driven by 5 in. Morse chain from the car axle. The entire train is lighted from this one machine, the cars being connected by the ordinary Gibbs three-wire connector. The committee reports that the original car equipped with this system has made 140,000 miles without a lighting failure and that the original driving chain has made 120,000 miles and is still in serviceable condition. It is estimated by Northern Pacific officers and engine men hauling the trains equipped with this system that a saving of one ton of coal per night over the head-end steam turbine system is made, which is equivalent to the saving of approximately 200 lb. of coal per hour. Another important advantage of the axle head-end system is that the steam leakage between the tender and the dynamo car is reduced to a minimum inasmuch as the pressure carried is reduced to an amount just sufficient to supply the necessary steam heat. The committee on this subject is D. J. Cartwright, Lehigh Valley, chairman; J. H. Davis, Baltimore & Ohio; E. W. Jansen, Illinois Central; C. H. Quinn, Norfolk & Western; H. C. Meloy, New York Central; J. R. Sloan, Pennsylvania R. R.; E. Wanamaker, Chicago, Rock Island & Pacific; C. R. Gilman, Chicago, Milwaukee & St. Paul; Ernest Lunn, Pullman Company.

#### ELECTRIC HEADLIGHT

The Committee on Locomotive Headlights had not prepared a formal report this year due to the unsettled condition of legislation affecting this subject. The chairman, however, gave a verbal report of progress during the year.

The committee is as follows: J. L. Minick, Pennsylvania, chairman; Charles R. Sugg, Atlantic Coast Line; J. J. Hack, Southern Pacific; E. W. Jansen, Illinois Central; H. R. Pennington, Chicago, Rock Island & Pacific.

*Discussion.*—E. S. M. Macnab (Can. Pac.).—What has been done with regard to changing the arc headlight to incandescent and has the gas-filled lamp altered the situation?

J. L. Minick (Penn.).—A number of roads are now changing from arc lamps to incandescent lamps; I see no reason why that change should not be made, usually with a considerable saving in wattage consumption. A line of incandescent lamps has been developed for locomotive headlight work either in a 6-volt or a 30-volt type and there should be no reason why they cannot be successfully applied to the equipment already in service.

C. R. Sugg (A. C. L.).—We have at present 210 incandescent headlights all equipped with 250-watt 32-volt lamps. We adopted the following procedure when ordering these headlights: We obtained three incandescent headlight equipments from manufacturers and put them on three locomotives. We then let three men have them for a while, after which we took them away from these men and gave them to somebody else. This started a fight. The men who first had the lamps wanted them back, but they were told if they desired that type of electric headlight they would have to make a written request for one. As a result, out of the 210 that we have now, about 175 were installed by special request of the engineers; in fact, it is now our practice to refuse to install them except by such special request. Every one of the locomotive engineers who have operated with the incandescent headlights says that they would not have the old electric arc lamp back under any consideration. Incandescent lamps that we now have are mostly on one division and the arc lamps on another. Where we have installed the incandescent lamps we have reduced the headlight failures considerably and I know that the maintenance cost is much less than for the arc lamps on account of the trouble we formerly had from burnt out armatures.

J. A. Andreucetti (C. & N. W.).—The North Western road has equipped today approximately 1,500 locomotives with incandescent headlights, using the 18 by 9 in. reflector.

President Jansen.—On some tests recently made by the Pennsylvania Lines West using a standard 18 in. by 9 in. reflector with a 250-watt 32-volt lamp, about six regular locomotive engineers were used as observers. These men had their eyes examined just before the test and at a speed of 20 miles an hour dropped a small sand bag when they first saw the object, nobody knowing at what point the object would show up. The average of all readings was a little over 800 ft. on the running test, but during the standing test the average of all observers was a little over 1,000 ft. The law specifies that the object must be seen at a distance of 1,000 ft., but it does not specify whether the locomotive should be running or standing still.

J. R. Sloan (Penn.).—Is the order as issued in such shape that it can be understood; does a railroad know what is required of it and if not what are the points that are undetermined?

J. L. Minick (Penn.).—From railroad men who are interested in this subject, I gather that the objection to the Interstate Commerce Commission ruling is the indefiniteness of the order. It specifies that engineman with normal eyesight shall be able, under normal weather conditions, to see an object the size and shape of a man dressed in dark clothing at a distance of 1,000 ft. There is not a single thing in that specification except the distance of 1,000 ft. that is definite. There is no normal eyesight; there are no normal weather conditions and a man dressed in dark clothing is also an indefinite description. What kind of a man, how big a man, how small a man? Is he tall or short, wide or narrow, white or black? What is dark clothing? I have put that question by letter to half a dozen of the big tailors in the United States and I have gotten just as many different answers; each one has his opinion as to what dark clothing is. My own impression is that the thing the railroads

would like to bring about is some kind of a specification that is definite in its terms and which can be measured and reproduced tomorrow as well as any other time. The suggestion of the railroads has always been to go to terms of candle power. Candle power can be measured exactly, the same as voltage, steam pressure, gallons of water or any other measurable quantity. If that point can be agreed upon, the only remaining thing is to have someone in authority, determine how much candle power.

#### ELECTION OF OFFICERS

The following officers were elected to serve the association during the year 1916-1917: President, C. J. Causland, Pennsylvania; vice-president, J. E. Gardner, Chicago, Burlington & Quincy; Executive Committee, western district, A. E. Voigt, Atchison, Topeka & Santa Fe; eastern district, C. H. Quinn, Norfolk & Western. The secretary-treasurer, under an amendment to the constitution adopted at this convention, will, in the future, be appointed by the executive committee instead of being elected by the association.

#### THE CANADIAN PACIFIC WAGE CONTROVERSY

The threatened strike of the conductors, trainmen and yardmen of the Canadian Pacific, scheduled to take place at 5 p.m. on October 25, was averted by the concession of the major points in the demands of the men.

The controversy had its inception in 1913, when the men made application for a new schedule and sent the management of the road a schedule embodying their demands. While there were certain requests for increased rates, their proposal provided more particularly for changes in the rules involving the bases for computing compensation. Some of these changes were of a drastic character, providing for a minimum day of nine hours or 100 miles, and in addition compensation for all switching, overtime and detention, the overtime and detention to be computed separately on each leg of short turn-around runs; separate payment for all preparatory and waiting time at initial terminals; separate payment for all time at objective terminals after the train is registered, and also separate payment for time held outside of yard limit boards on account of a yard being congested; payment for all switching done at junction points on the same basis as compensation for terminal switching. Many minor changes in rules were also requested, practically all of which involved some increase in pay. They also asked for a reduction in the maximum monthly mileage of main line passenger crews, an increase of branch line passenger rates to the main line figure, a raise in pay of two cents an hour for all men in yard service and special compensation of \$10 a month for all train baggage-men having anything to do with the handling of mail.

The company declined to meet these requests on the ground that the changes in rules involved false bases for computing time, and that an increase in compensation was not justified owing to the business conditions then prevailing in Canada. Furthermore, all Canadian Pacific trainmen except in mountain territory had a nine-hour day and in other respects were better paid than men on American railways in the northwest. The men then applied for a board of conciliation, in accordance with the Industrial Disputes act. A board was duly constituted, one member being nominated by the company, one by the men and the third by the Minister of Labor. The majority of the board, consisting of the nominee of the company and the neutral chairman, brought in a report denying the majority of the major requests of the men but granting considerable concessions. The nominee of the men brought in a minority report, granting the requests of the men practically in full. While the company objected to certain features of the majority report, it signified to the Minister of Labor that it was prepared to put the award into effect.

This brought the negotiations up to August, 1914. Great

Britain declared war on Germany on August 4, 1914, and two or three days later the representatives of the men wrote the Minister of Labor stating that they were wholly dissatisfied with the report of the board of conciliation and would not accept its findings, but that in view of the fact that war had just been declared they deemed it unpatriotic to take a strike vote. They informed him, however, that their action did not bind them permanently, but merely delayed the strike vote for a shorter or longer time as they might decide. They further intimated that should the company attempt to apply the award of the board in the meantime, they would regard it as an unfriendly act. Upon receipt of a copy of this communication from the Minister of Labor, the company advised him that in view of the attitude of the men it would not apply the award of the board but would leave in effect the schedule then in existence.

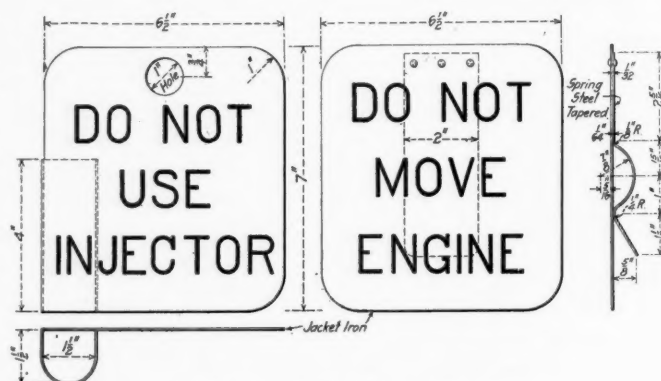
Nothing further was heard from the men on the subject until September, 1916, when a general committee of conductors, trainmen and yardmen, representing the entire system, requested an interview with the officers of the Canadian Pacific. They announced that the men had finally rejected the majority award of the board of conciliation and that they desired to submit to the company their original demands of 1913 without amendment. They expressed their willingness to receive a counter proposition from the company, but intimated that no counter proposition would receive much attention unless it involved the acceptance of nine "major demands." It was suggested to them that as two years had elapsed and conditions had changed materially, it might be worth while to submit the matter again to arbitration, but they promptly refused to do this. They further asserted that as they were submitting their original proposition without amendment and as it had been passed upon by a board of conciliation, they had fully complied with the law and were at liberty to strike without the possibility of intervention by the Department of Labor. On account of the war the company's officers felt that they should do everything in reason to prevent a labor conflict and accordingly offered certain substantial concessions in addition to the award of the board. These were rejected and a strike vote was taken over the entire system. The ballot was not secret and the result showed that considerably over 90 per cent of the men voted to strike. Following the vote the company offered further concessions without avail, and the men gave notice that the strike would begin at 5 p.m., October 25.

On the ground that the men were evading the spirit, if not the letter, of the Industrial Disputes act, the company applied for a board of conciliation, and the Minister of Labor notified the men, offering his assistance in effecting a settlement. The men held that they were not violating the law and announced that a strike would take place unless the company settled the matter directly with them. The Minister of Labor, apparently not sure of his ground as to the legality of the men's position, then advised the company that it would be useless to appoint a board in the face of the obdurate attitude of the men, but that he would send a well known labor leader of modern views to Winnipeg to act as mediator in the dispute. This mediator arrived in Winnipeg on October 23, and on the same date the Prime Minister of Canada, Sir Robert L. Borden, telegraphed the men, offering his services to make for a settlement and suggesting that they and the officers of the Canadian Pacific confer with him at Ottawa, the strike to be postponed in the meantime. The men replied that it was too late to call off the strike as a majority of the committee of the unions had left for their homes, leaving instructions to the heads of the organizations to abandon the strike under no circumstances except the surrender of the company. When the officers of the Canadian Pacific were apprised of this stand, it was realized that the Canadian government could accomplish nothing. They, therefore, offered through the mediator to submit all questions in dispute to

the arbitration of one individual whose decision would be final and binding on both parties. Names suggested for the position of arbitrator by the company included Sir Robert L. Borden, Sir Wilfred Laurier, ex-Prime Minister of Canada, Sir Charles Fitzpatrick, Chief Justice of the Supreme Court of Canada, and Ash Kennedy, Assistant Grand Chief of the Brotherhood of Locomotive Engineers. This offer was promptly and emphatically rejected by the men. The company was, therefore, confronted with the alternative of allowing the strike to occur or conceding the major points in the men's demands. For patriotic reasons the executive of the Canadian Pacific chose the latter course.

### PROTECTION OF MEN WORKING UNDER ENGINES

The drawing shows the style of two caution signals or signs to be used in the cab of a locomotive for the protection of any person who may be working under or about the engine. These signs are made of jacket iron, 6½ in. by 7 in. in size, and the inscriptions explain themselves. These signs have recently been adopted as standard by the



Erie Standard Safety Signs

mechanical department of the Erie Railroad. The plates are painted black and the letters are white. The sign shown at the right is fastened to the throttle lever by means of the flat spring, as shown. That on the left is hung on the injector handle.

**ITALIAN RAILWAY RETURNS.**—For the financial year 1914-15 the Italian Treasury has had to make up a deficiency of approximately \$4,000,000 in the net receipts of the state railways. This covers a period before Italy joined the allied cause, but her railways were affected by the displacement and closing of markets, and by the high prices of coal and material. The suspension of navigation in the Adriatic, and the absence of tourists, has also contributed to the deficiency.

**WHAT AMERICAN LOCOMOTIVES CAN DO.**—With an American locomotive of the Decapod type, a member of the engineering board of the Russian Ministry of Ways of Communication has established a new European record for the most heavily loaded train. He brought over the Nikolaief division of the Southern Railway a train with a load of 4,424 tons. Its length was 2,800 ft. The trip was experimental. A Russian engine was tried out against the American and the superiority of the latter was clearly established. An Odessa paper of September 5, 1916, states that a number of American freight cars are giving great satisfaction on the Ekaterinskaya Railway because of their great capacity. It is said, however, that because the American cars have their doors at the side they are unsuitable for hauling wood. The railway authorities are contemplating remodeling some of the cars and placing the doors at the ends.

# The Construction of the Chiriqui Railway\*

A Description of the Interesting Methods Followed  
in Building a Narrow Gage Railway In Panama

By A. S. Zinn

Formerly Consulting Engineer, Chiriqui Railway, Republic of Panama.

A RAILWAY through the Republic of Panama first became a project of national importance at the time that Col. Wm. F. Shunk made a survey through this republic for the widely-discussed Intercontinental Railroad from Mexico to Buenos Aires in 1893. Soon after the separation from Colombia and the creation of the republic of Panama in November, 1903, various railroad projects were discussed by the several succeeding governments and legislation was enacted authorizing the executive to undertake certain projects. In 1910 a survey for a narrow gage railway was made from Panama City to David, a distance of 200 miles, the estimated cost of which was about \$10,000,000. The project was abandoned and nothing more was done until after Belisario Porras was elected president in 1912.

It was the opinion of President Porras and his advisers that the practical way to develop the best part of the republic would be to construct a railroad from Pedregal on the Pacific Coast to David, the capital of Chiriqui province, with branch

Canal. This board consisted of Captain R. E. Wood, Captain W. H. Rose and A. S. Zinn, of the Panama Canal, and it reported in favor of the construction of the Chiriqui Railway. By recommendation of Col. Goethals, the Government of Panama appointed the writer consulting engineer.

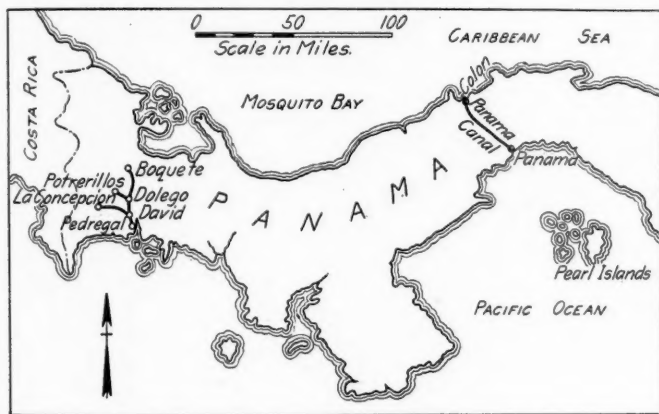
In February, 1914, the contract was let to R. W. Hebard & Co. for the engineering and complete construction and equipment of the Chiriqui Railway, ready to operate. As the government had very little money in its treasury, the President was authorized to negotiate a bond issue abroad, up to such amount as would be necessary to complete the railroad. The approval of the State Department at Washington was secured and negotiations were eventually concluded for the sale of the 30-year 5 per cent. Republic of Panama bonds at a good price.

The construction work was started in April, 1914, and carried on slowly for seven months at the entire expense of the contractors on account of the delay in financing the project, the government not being able to secure any money on the bond transaction until November, 1914. The work was then continued with a much larger force of men and the best available construction equipment, consisting of two second-hand 18-ton saddle-tank type locomotives from Panama Canal and two new 99-ton consolidation type locomotives, one 70-ton steam shovel, one wrecking crane, 12 dump cars, 20 flat cars and two motor cars. The steam shovel was only used in loading gravel ballast. All of the excavation, amounting to 410,223 cu. yd. was done by hand with the use of one yard steel dump cars pushed by hand and 2-ft. gage tracks that could be quickly laid and shifted to any position required. This method of handling material from narrow cuts and short haul fills was found to be economical on the Panama Canal and is popular with all contractors at work in the tropics where one has to contend with a great deal of rain and mud. Grading with teams and scrapers is very seldom used as it has proved to be slow and expensive.

The total length of main lines exclusive of side tracks was 57 miles. On the line to La Concepcion, a distance of 18 miles, the maximum grade is 3 per cent and the maximum curvature 6 deg. on the 32-mile line to Boquete the maximum grade is 5 per cent and the maximum curvature 12 deg. In climbing the slopes leading up to the mountains around Boquete the average grade is 4.2 per cent and the maximum curvature 5 deg. for a distance of nine miles. On a spur track seven miles long at Potrerillos the maximum grade is 5 per cent and the maximum curvature 5 deg.

The consolidated type of engines purchased was guaranteed to haul 120 tons behind the tender, up a 5½ per cent grade, at a speed of ten miles per hour. It was found by actual test that one of these engines hauled 150 tons at a speed of 15 miles per hour up a 5 per cent grade, part of which was on a 12-deg. curve.

The principal considerations in the construction of a railroad in the tropics are good side-ditches and sufficient openings with well constructed culverts and bridges. The rainy season continues for eight months, during which time the rainfall in Chiriqui averages about 140 in. or about 3½ times the total precipitation in Illinois for one year. To provide for such floods safely on the 57 miles of track, it was found necessary to construct 26 steel bridges and 108



Map of the Chiriqui Railway and Vicinity.

lines to La Concepcion, Potrerillos and Boquete. The country around La Concepcion is rich in the production of bananas, sugar and tobacco. The llanos (prairies) along the line of railroad do not only produce rice, corn and all kinds of tropical fruits, but they provide first class pasture land where thousands of horses and cattle are raised with very little trouble and expense.

The country around Boquete, at an elevation of 3,500 to 6,000 ft. above sea level, produces as good a grade of coffee as any place in the world, with about 20 large plantations under cultivation. With a few exceptions the inhabitants of the province outside of the leading towns are Indians and a mixture of Indian and Spanish. They are not progressive and they discourage any modern improvements. So, in order to induce a better class of people to settle in this country, it was believed a well equipped railroad would be a solution to the problem.

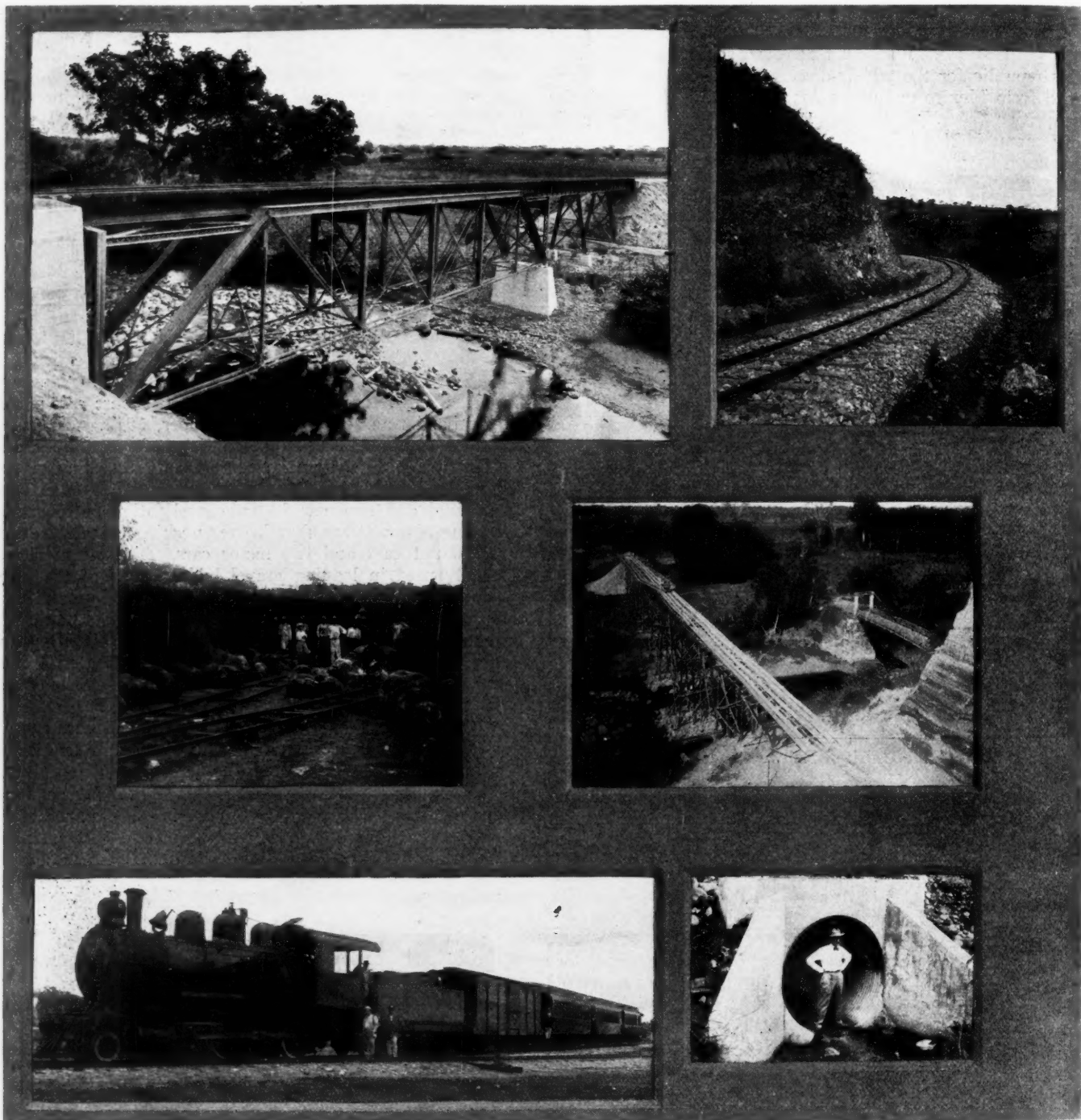
Maps, profiles and estimates for railroads in three of the most important provinces were submitted to the government. The president of the republic submitted plans and estimates of the Chiriqui project to a board of engineers appointed by Col. George W. Goethals, chief engineer of the Panama

\*Abstracted from a paper presented before the Western Society of Engineers, Chicago, on November 6, 1916.

culverts. The majority of the culverts were of corrugated ingot iron pipe, 24 in. to 72 in. in diameter, with concrete end and wing walls. All the large pipes under heavy fills were reinforced throughout with concrete one foot thick to prevent sagging. The balance of the culverts ranging in size from 6 ft. by 6 ft. to 10 ft. by 10 ft. were made of reinforced concrete and rubble stone masonry. All of the steel bridges were furnished by the American Bridge Company.

for unloading and loading construction material. The material was then taken up the Pacific Coast 325 miles and unloaded at the new dock at Pedregal.

The masonry for the bridges was built in advance of track work, consequently it was necessary to haul the cement and form lumber in ox carts for 5 to 20 miles over very bad roads. The rock for the concrete was crushed by hand at the bridge site. All concrete was mixed by hand and wheeled into the



Bridge Over the Rio Chirigagua on the La Concepcion Line  
Excavating by Hand  
A Typical Passenger Train

The bridge material was shipped from New York to Colon, about 2,000 miles, where it was loaded on Panama Railroad cars, transferred to Panama, where it was unloaded on the docks, and then transferred to small barges on which it was taken out about a mile to a larger boat which was built for hauling cattle and passengers, with no modern equipment

Typical Rock Ballasted Track  
Temporary Construction Trestle Over the Rio Chirigagua  
A 72-in. Corrugated Iron Culvert Reinforced with Concrete

forms, as this was cheaper than using a concrete mixer. As soon as the track was laid to a bridge site, the heavy false work timbers for erection, made from native Mangley timber, were delivered by work-train, and as soon as erected the iron work was delivered and erected with very little delay. The culvert pipe was all hauled by ox teams and put

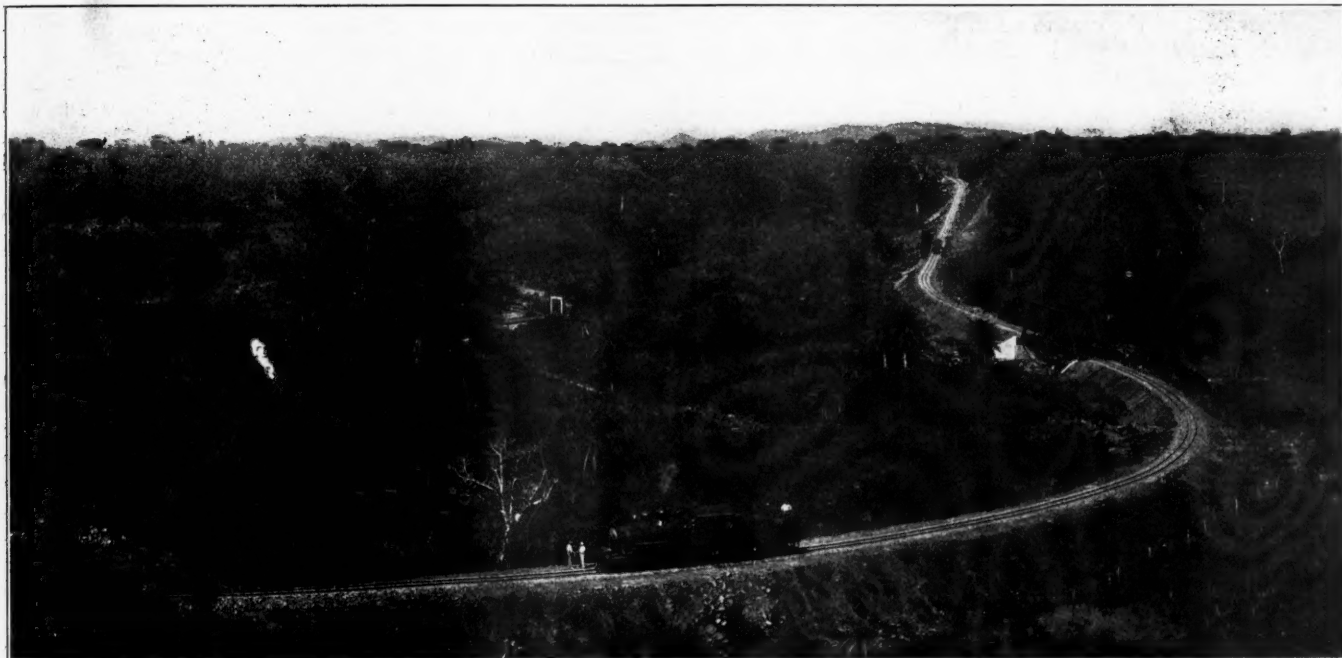
in place ahead of the grading. All of the concrete work for the culverts was completed after track was laid, to save money in the transportation of material.

As soon as the track was laid on the sub-grade for about 15 miles ballasting with broken stone was started. As plenty of good quality stone was found all along the line between David and Boquete, I suggested to the contractor the use of a portable crusher. He was in favor of a stationary crusher. Finally a young foreman said he believed he could use native labor to break by hand the boulders along each side of the roadbed and do it cheaper and more satisfactorily than could be done with either a portable or a stationary crusher. As an experiment he was allowed to break stone for one mile of ballast and it was found that he was correct. Consequently all of the broken stone ballast required on over 33 miles of the road was broken by hand, the big saving arising from the fact that it was piled along the roadbed in long piles, 1 ft. high by 3 ft. wide, for convenience to estimate, and saved transportation expenses, as it could be thrown in place with shovels. In the original estimate, creosoted ties 5 in. by 7 in. by 6 ft. were specified. These would come from the United States. About 168,000 were

sections. Right of way fences were built in the same manner as is customary with the natives, by stretching four barbed wires on wild plum posts. Large posts were firmly set in the ground about every 30 ft. to stand the pull on the wire, and in between about every 2 to 3 ft. small plum posts 2 in. to 3 in. in diameter, were set about one foot in the ground. These soon take root and grow rapidly, so that in a few years the posts are a line of growing trees, which not only make a very good fence, but the cost for maintenance is small. However, on account of the delay in securing the great number of posts required, and the time it took to build such a fence, I would hereafter recommend indestructible fenceposts with five barbed wires for a similar country.

Most of the cattle guards were steel surface guards with the side fences and posts made by sawing up the sheet piling used at the bridge foundations. This would not be economical in the United States, but down there, where we had no more use for the piling and the cost of transportation is high, it was economical. It cost very little to saw them and drill holes at the shops ready to deliver and erect at the road crossings.

No reverse curves were allowed. The only curves where



Crossing the Rio Grande Valley on the Boquete Line with Maximum Grades of 5 per cent and Curvature of 12 deg.

required. After the contractors had delivered about 40,000 of them, the consulting engineer recommended to the government that native ties of the best available woods be used. About 15 varieties of wood were specified, the better quality being *lignum-vitae*, *mameyeilla*, *moro*, *mario* and *coroto*. The principal reason for recommending native ties was that the money expended would benefit the people in the province and after four or five years they would know from experience the best kind of wood to use in tie renewals for maintenance and would not be required to wait on shipments from the United States. While some very good native ties were furnished, as a whole they were not as good as the creosoted ties, and on account of the scarcity of timber and the inexperience of the men furnishing the ties it did not only delay the work, but proved to be more expensive and caused more delays than to have shipped creosoted ties from the United States.

It was decided at first to use 70-lb. second-hand rail from the Panama Canal, but only 26 track miles could be secured that was good enough for the purpose; so the balance of the track was laid with new 56-lb. rail, both being A. S. C. E.

spirals were used were at places where trains are likely to run at a speed of over 20 miles per hour. On account of the steep grades trains will not be required to run at an average speed of over 18 miles per hour; consequently the superelevation of the outer rails on curves was made to correspond.

During the construction period, wood was first used in the engines and later coal while the necessary number of oil tanks were being erected so as to be able to change the engines to oil burners soon after the road started operation, as it was proved on the Panama Canal and the Panama Railroad that oil was a cheaper fuel.

The original form of contract adopted was that known as "cost plus a percentage with a bonus for economy." Soon after the work started I saw the trouble and extra expense it would cause the contractors and the government to carry out such a contract 325 miles from headquarters. Under the "cost plus a percentage" form of contract, the contractors were to submit to the government for investigation and approval on the 25th of each month a complete statement of all expense incurred on account of the work for the previous month, including payrolls, canceled accounts, vouchers

and all other statements. This would mean that all the accounts pertaining to the "thousand and one" kinds of expenditures natural to a work of such magnitude and character would have to be prepared quadruplicate in English and Spanish. This would require a large clerical force for the contractors, and the government in turn would have to employ accountants to examine this large mass of data each month. This would naturally have caused confusion, misunderstanding and serious delays in effecting payments.

It was then decided to change the contract to a "Fixed Sum" form of contract, using the same estimate of cost as provided for in the original contract, together with the original specification. The government would then have the assurance and satisfaction of knowing that the railway would be completed according to specifications for a guaranteed fixed sum, and, if the cost exceeded the contract price, the contractors assume this excess for their account.

The estimated cost or "Fixed Sum" was \$1,628,141, or about \$32,563 per mile. Later it was decided to build the Petrerillos line of seven miles, build a 410-ft. span wagon bridge, repair several wagon roads and bridges and construct 50 miles of telephone and telegraph lines to aid traffic and operation. This additional work was done at actual cost, with 5 per cent of the cost to go to the contractors for doing the work. This additional work brought the total cost up to a little over \$2,000,000.

The contract time for completion was May 1, 1916, but on account of the extra work and heavy rains it was not completed until July 1, 1916.

The completed railroad is as well constructed and equipped with rolling stock, shops and station buildings as the average railroad in the United States. The cars are of sufficient capacity to handle the traffic and the railway as a whole will answer all purposes for which it was built as well as a standard gage railroad would. The saving in cost in construction and equipment of a narrow gage railroad compared with standard gage is not as great as many engineers may believe. The principal saving is in the cost of ties, ballast, excavation and bridges, the total saving being approximately 6 per cent.

### CENTRAL AND WESTERN ASSOCIATION OF CAR SERVICE OFFICERS

The Central and Western Association of Car Service Officers held its semi-annual meeting at the Grand Pacific hotel, Chicago, on November 1. L. M. Betts, car accountant of the Belt Railway of Chicago, and vice-president of the association, presided. The meeting was devoted principally to the consideration of committee reports, the most important of which was that of the Per Diem committee. This committee offered the following formula for determining monthly the reclaim allowance for terminal switching between carrier roads under Per Diem Rule 5 of the American Railway Association:

1. Reclaim statements shall include only cars on which per diem is paid by the switching line. The statement shall show initials and numbers of cars, date received, date delivered and the number of days on line; the number of days on line to be determined by subtracting the date of receipt from the date of delivery.

2. On cars received from and returned to the same road, making a loaded movement in one direction and an empty movement in the opposite direction, the switching road may reclaim for the total number of days per diem actually paid, with a maximum of — days per diem on any one car, except that when the average detention of all cars under this paragraph equals or exceeds five days, the reclaim on such cars will be an arbitrary of five days per diem on each car.

3. On cars received from and returned to the same road, making a loaded movement in both directions, the switching

line may reclaim for the number of days per diem actually paid, with a maximum of — days on any one car, except that when the average detention of all cars under this paragraph equals or exceeds ten days, the reclaim on such cars will be an arbitrary of ten days per diem on each car.

4. An arbitrary amount of — days per diem may be reclaimed by the switching line on all cars:

- a. Picked up empty and delivered loaded.
- b. Received loaded and not returned to the delivering line.
- c. Returned empty to road received on account cancellation of order or error on part of delivering road, including cars unfit to load.

5. An exception shall be made on cars loaded with live-stock (not including emigrant outfits), on which reclaim may be made by the switching line for the actual per diem paid with a maximum of — days per diem on any one car. No reclaim will be allowed on such cars when handled under Paragraph 4, Section D.

6. Cars shall appear on the reclaim statement for the month in which they are disposed of. No supplementary reclaim shall be made on account of error in the date of interchange, as shown on reclaim statement, discovered after reclaim has been settled. Supplementary reclaims for cars omitted from regular reclaim statements shall be figured as new statements. Reclaims made by carrier lines for cars included on reclaim statements by switching lines in error, shall be on the basis of the actual amount of reclaim allowed on such cars.

Note.—The days left blank in the above formula are to be determined jointly by the railroads according to local conditions.

A resolution was passed by the association approving the formula presented by the committee, and referring it for consideration to the Association of Transportation and Car Accounting Officers with a recommendation that the American Railway Association be requested to make it mandatory.

A resolution was also passed reaffirming the action of the association on April, 1916, when a recommendation was made to the Association of Transportation and Car Accounting Officers for a change in Per Diem Rule 5 which would recognize a separate basis for settling reclaims with purely switching lines as compared with reclaims between carrier roads performing switching service. This resolution will be brought to the attention of the senior association.

The Committee on Office Methods and Accounting presented a report on methods of determining the proper rate to be applied on cars home-routed via the shortest and most direct route and the matter of handling per diem claims after records have been destroyed, in accordance with the Interstate Commerce Commission ruling. As the committee made no definite recommendations as to either of these subjects they were referred back to the committee for further consideration.

The question of a proposed increase in the per diem rates was referred to the proper committee for consideration until the next meeting.

No report was made by the Committee on Pooling Freight Equipment, but W. E. Beecham, secretary of the association, discussed the subject at length. He does not favor pooling freight cars, but is a strong advocate of the creation by the railroads of a national car distributing agency with authority to force the movement of cars into parts of the country where they are most needed.

THE WAR BONUS IN IRELAND.—Although the railways in Ireland are not under the control of the government, and therefore do not have their net receipts guaranteed, they are paying their men a war bonus which, of course, comes out of the pocket of the shareholders.

# Some "Inside Workings" of the B. of L. E.

## Engineers Describe Treatment of Brotherhood Members Who Oppose the Organization's Legislative Plans

**S**ENSATIONAL testimony regarding the methods of the Brotherhood of Locomotive Engineers in dealing with its members who disagree with the legislative plans of its officers was presented at a hearing before Examiner-Attorney Hines of the Interstate Commerce Commission at Washington last week on the commission's order requiring the railroads to adopt high-power headlights.

W. H. Rother, an engineer employed on the Cleveland, Cincinnati, Chicago & St. Louis, testified that he had been tried and acquitted by his local division of the brotherhood, No. 492, at Indianapolis, on charges preferred by Grand Chief Engineer Warren S. Stone of violation of the "laws" of the brotherhood in testifying before the Interstate Commerce Commission that he regarded electric headlights as dangerous. After his acquittal, Grand Chief Stone had recalled the charter of Division 492 and organized a new division in its stead, excluding Rother, together with those who had voted for his acquittal, and those who had refused to obey an order to refrain from associating with Rother.

J. T. Heller, another Big Four engineer, testified that he had been expelled from Division 143 of the brotherhood on charges preferred by Stone because of his testimony before the Interstate Commerce Commission.

A. E. Martin, also a Big Four engineer, said that he had been excluded from Division 546 and ostracized by his fellow members for acting as Rother's attorney at his trial, and that the only evidence presented against Rother was a copy of his testimony before the Interstate Commerce Commission.

D. P. Keller, an engineer employed on the Pennsylvania Railroad, testified that he had been tried and acquitted by his local division, No. 74, on charges preferred by order of Grand Chief Stone because he had expressed an opinion unfavorable to electric headlights in the presence of a member of the Pennsylvania legislature, and that he had afterward been expelled on charges preferred by Stone because he had joined the Pennsylvania Mutual Beneficial Association. He also testified that he had sent to the Interstate Commerce Commission a copy of a circular addressed by Mr. Stone to members of the brotherhood, threatening them with expulsion if they interfered with the plans of the brotherhood in connection with headlight legislation.

D. P. Trostle, an engineer on the Philadelphia & Reading, testified that H. E. Wills, legislative representative of the Brotherhood of Locomotive Engineers, and A. G. Pack, assistant chief inspector of locomotive boilers of the Interstate Commerce Commission, had warned him while in the hearing room of the Interstate Commerce Commission on October 30 that he would be violating the laws of the brotherhood if he testified unfavorably to high-power headlights.

These engineers were allowed by the Interstate Commerce Commission to present their testimony only after a vigorous objection by Mr. Stone and W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, and after the hearing had been interrupted for a day while the commission deliberated over a statement filed by counsel for the railroads, outlining the character of the evidence they proposed to introduce. After the testimony had been allowed, Mr. Stone admitted the principal facts alleged and identified copies of letters which he had written bearing on the cases.

### THE BROTHERHOOD "LAW"

The sections of the "Constitution and Statutes" of the Brotherhood of Locomotive Engineers under which members

have been expelled for giving testimony before the Interstate Commerce Commission are given herewith:

#### "MEMBERS INTERFERING WITH BOARD—PENALTY."

"Sec. 11. Any member or Division refusing to sustain the official acts or instructions of the Legislative Board, or who circulates or signs any petition, or who, by verbal or written communication to railroad officials or others, calculated to injure or interfere with legislative matters offered by the Legislative Board or at any time makes suggestions to railroad officials or to state legislators that may be detrimental to the interests of the B. of L. E., or any train service organization, shall be expelled, when proven guilty, as per Sec. 49 of the Statutes."

#### "INTERFERING WITH NATIONAL LEGISLATIVE MATTERS."

"Sec. 12. Any member or Division who, by verbal or written communication to anyone calculated to injure or interfere with national legislative matters, offered by our Legislative Representative at Washington or Mexico, or at any time makes suggestions to anyone that may be detrimental to the interests of such legislation, shall be expelled, when proven guilty, as per Sec. 49 of the Statutes."

Nearly a score of engineers running fast passenger trains on roads entering New York City testified that, in their opinion, electric headlights would be a positive menace to safety of operation in their territory because they obscured signals and temporarily blinded engineers who had to face such headlights approaching from the opposite direction. Some of them had had experience with electric headlights on their own engines, others had faced them on electric trolley lines paralleling their own lines, and all of them had been present at tests with electric headlights made on the New York Central recently. In addition, 45 locomotive engineers and 13 road foremen of engines and locomotive inspectors presented to the commission through counsel for the railroads a petition that they be allowed to testify, but the commission declined to change the ruling it had previously made limiting the number of witnesses to 20 for the railroads and 20 for the brotherhoods.

A report of the testimony given at the hearing before the commission on October 30 and 31 and November 1, was published in last week's issue. The attorneys for the roads asked the commission to modify its headlight order, which has been postponed to January 1, 1917.

### ROTHER'S TESTIMONY

On Thursday, November 2, William H. Rother took the stand and said he had testified before the commission at its hearing in Washington on September 30, 1915, after which charges had been preferred against him by order of Grand Chief Stone for conduct unbecoming a member and violation of the rule of the organization forbidding members to oppose legislation advocated by the brotherhood. Stone and Carter immediately entered a protest against the continuance of this line of testimony and Examiner Hines decided to submit the question to the commission at the noon recess. Mr. Stone admitted that he had preferred charges against Rother, but insisted that "the dirty linen of the B. of L. E. should not be brought before the commission," and that "the brotherhood can take care of its own private affairs." He said if he had made a mistake his international officers would take care of him, and if Rother had any grievance the courts could take care of him. He said the railroads had brought to Washington as witnesses "every man who has a suit against the brotherhood or who is in disrepute with the brotherhood for violation of its laws." Mr. Carter said the organizations had found it necessary to enact laws for disciplining their members, particularly in connection with legislative matters, and he insisted that Rother's testimony be stricken from the record. He also insisted that the commission should not even be allowed to see the testimony unless he was allowed to make a statement in connection with it.

D. E. Minard, assistant general counsel of the Erie, asked permission to submit a formal statement outlining the testimony to be offered and giving the reasons why it should be admitted. Late in the afternoon the commission announced a ruling that counsel for the railroads might file a statement for the record of testimony they desired to offer regarding "the intimidation or threatening of any witnesses in this investigation." The hearing was then adjourned until 7:30 on Friday evening.

Before the adjournment, Mr. Stone continued to object to the introduction of testimony regarding "the inside workings of the organization." Mr. Carter asked if the commission would read the testimony before deciding the matter. When informed that the commission had read it, he made a formal request for the privilege of putting in a statement. The statement filed on Friday morning by counsel for the railroads, C. C. Paulding, solicitor of the New York Central; D. E. Minard, assistant general solicitor of the Erie, and S. B. Lloyd, assistant general counsel of the Pennsylvania, is as follows:

#### STATEMENT OF EVIDENCE BY RAILROAD COUNSEL

"Counsel offer to prove:

"That two witnesses, W. H. Rother and John T. Heller, who testified in this proceeding, before this commission, in Washington on September 30, 1915, and who were members of an organization known as the Brotherhood of Locomotive Engineers, were subsequently, and in December, 1915, charged at the instance of W. S. Stone, the grand chief of said brotherhood, with a violation of a specified rule of said organization, in giving such testimony. That each of such witnesses was tried before the respective division of such organization of which each was a member, and the proof adduced against each upon such trial was a copy of the testimony given by him in Washington, and the fact that he so testified. That one of said witnesses, namely, Heller, was found guilty of violation of the said rule of the said brotherhood in so testifying and was expelled from said organization. That the other witness, Rother, was acquitted after such trial and by a vote of the division to which he belonged, of the charge made, and that subsequently W. S. Stone, said grand chief, ordered that on account of such vote and such acquittal, the charter of the division should be surrendered. That the charter was taken away, and that a new charter was issued to a new division in the same city, and that the witness Rother, the men who voted to acquit him, and six others, who were friends of his, were omitted from said new division, and have ever since been denied the right to become members of the same or any other division.

"Counsel further offer to prove that on Monday, October 30, 1916, two men, namely, D. P. Trostle and W. M. Prutzman, who were present in the room of the commission, as witnesses in this proceeding, on behalf of the railroads, and who are members of the said brotherhood, were advised of the fate of the above named witnesses, Rother and Heller; that each are liable to expulsion, and that the names of all those members of the said brotherhood who were present in Washington as witnesses on behalf of the railroads, were being taken and would be sent to Cleveland, the headquarters of said brotherhood, for action.

"The purpose of this testimony is to fully advise the commission as to the facts, and as to the circumstances and conditions under which the witnesses who have testified, and who may testify in this proceeding, have given or may give their testimony, to show the earnestness and sincerity of such witnesses, and of each of them, in giving their testimony in the face of threatened punishment which awaits them, or such of them as are members of the said brotherhood; and to invoke for such witnesses the protection of the commission, in so far as such protection may properly be extended, in preventing punishment to them for the testimony given.

"It is contended that the foregoing testimony and other testimony which can be offered as to the penalties which have been enforced against other members of the said organization on account of the protests made by them in prior proceedings upon the subject, is relevant as bearing upon the whole subject under consideration, more particularly as bearing upon the claim that has been so frequently and confidently made by those favoring the rule under consideration, that all the employees favored the adoption of the rule, and as showing the reason why such claim was and is so confidently made."

When the hearing was resumed on Friday evening, Examiner Hines announced that the commission had concluded that while it is not interested in the rules and regulations of private organizations, in order to properly weigh the evidence, "it is interested in being advised with respect to deterrent influence brought to bear upon witnesses." It, therefore, denied the motion to strike out the testimony. Mr. Carter again asked the privilege of making a statement and was told that any officer of the brotherhood could be put on the stand to meet the testimony offered by the railroads.

W. H. Rother was recalled and continued his testimony regarding his expulsion from the organization. His trial was held at Indianapolis on December 27, 1915. The day before he had been shown a letter from Stone to the chief

engineer of Division 492, H. McHale, directing that charges be preferred against him. Mr. McHale had done so and he had been notified by being served with a copy of a letter signed by Mr. McHale, together with a notice to appear at the next meeting for trial. The letter was as follows:

"To the Officers and Members of Division 492:

"You will note communications from our Grand Chief Engineer W. S. Stone, relative to Bro. W. H. Rother of Division 492, in opposing the 'power headlight bill' before the Interstate Commerce Commission and the unpleasant task he imposes on Division 492.

"So I see no reason for delay in this matter and I do not think it right to ask any brother to do something that I do not like to do myself.

"I here prefer charges against Bro. William H. Rother for violation of Section 12, page 87, of the laws governing legislative boards, violation of obligation and unbecoming conduct."

Alexander E. Martin, a fellow member of the division, acted as Rother's attorney and out of about 180 members of the division only 17 voted. Of these 11 voted not guilty and 6 guilty, and Rother was declared acquitted. Mr. Rother said that the chairman of the investigating committee had stated that as far as Mr. Rother's veracity was concerned, it could not be questioned. He had then read the charges and the only evidence offered was a copy of Rother's testimony at Washington, together with a letter from Mr. Stone. "The only thing that was said," Mr. Rother testified, "was that the mere fact of my being at Washington was sufficient to expel me."

On the following Sunday, when he and several other members went to the lodge hall, they found that the charter of the division was gone. They afterward heard that Stone had ordered it revoked and a new division was organized, No. 546, from which Rother, Martin, the 11 members who had voted to acquit him, and six others who had refused to obey an order not to associate with Rother, in accordance with the brotherhood's "silence vote" were excluded. Mr. Paulding then read into the record the following letter signed by W. S. Stone, per W. P. Dougherty, chief clerk, dated January 7, 1916, and addressed to the secretary-treasurer of Division 492:

"We received your letter of December 28, relative to the case of Brother Rother, and as we furnished the division with ample evidence of this brother's guilt, it is very evident that the time has arrived when it is impossible to get the division to comply with the laws; therefore, effective this date, the charter of Division 492 is suspended and we will ask you to forward the charter, books, rituals, seal, etc., to the Grand office."

This letter was identified by Mr. Stone.

When they heard that the new division was being organized at Indianapolis, a committee of Rother's friends called on Mr. Stone, but he refused to see them. They then changed the locks on the division hall and retained possession of it.

Rother was cross-examined by Mr. Stone, but the subject of his trial was avoided. Stone asked if he had not been promoted to the position of special headlight inspector since his testimony before the commission. Rother said he had been promoted to that position, in addition to his duties as engineer, in January, 1915, long before his testimony. He also answered in the negative to questions by Stone as to whether he had not denied being in New York at tests conducted by the New York Central and as to whether he had not made the statement that he would rather buy an electric headlight out of his own pocket than be without one.

"Is it not a fact," asked Stone, "that after the question came up in regard to your testimony, that you repeatedly said to different engineers on the division that if I had asked the proper questions you would have testified in favor of the electric headlight?"

"No, Sir," replied Mr. Rother, "I did not, for you were not present when I was questioned."

Mr. Carter also cross-examined the witness and made much of the fact that his duties were to see that the headlights used by the Big Four are in good condition.

A. E. Martin, who had acted as Rother's attorney, corroborated his statement that his testimony before the com-

mission was the only evidence against him. He also testified about finding the charter gone, and hearing about the new division being organized. He and two associates then called on Stone at his office and asked for information. They were shown a letter to Stone written by the chief engineer of Division 492. "The letter read in part," said Mr. Martin, "that Brother Rother had been exonerated and something will have to be done and done quick, and I guess it was done quick, because at the next meeting there was no charter."

He had pleaded with Stone to return the charter but had merely been told to put his request in writing, and Stone had issued 175 transfer cards to the members of Division 492, leaving out 17. Stone asked if the 17 "insurgents" had not continued to hold regular meetings in the hall. Mr. Martin said that they did, but that the members of the new Division 546 had a suit in the state courts asking for the appointment of a receiver for the furniture of the division hall. The 17 members then filed a cross-complaint demanding the restoration of their rights and the money they had paid into the division treasury.

John T. Heller of Indianapolis, an engineer on the Big Four, also said he had testified before the Interstate Commerce Commission last year and, on charges preferred against him by Stone in a letter to Division 143, was tried and expelled from the organization. He said that the only evidence offered against him was a copy of his testimony before the commission. He had witnessed the tests at New York and said he would not want to ride behind an electric headlight in that territory; that it was bad enough on his own road, where he had operated an electric headlight for 20 years. His run is principally on a single track, he said, but engineers of freight trains that he passed at one point had made complaints about the effect of his light. He had also had trouble with electric lights on automobiles and inter-urban cars running parallel to his track. Asked if he thought an electric light would be a safe device in the vicinity of New York, he said:

"No, if you had tracks and business like you have got down there where we made those tests, we would all be in the dark. We wouldn't get in in time to come back."

#### WITNESSES WARNED DURING HEARING

David P. Trostle, an engineer on the Philadelphia & Reading, testified about conversations he had had with H. E. Wills, legislative representative of the Brotherhood of Locomotive Engineers, and A. G. Pack, assistant chief boiler inspector of the commission, immediately after the hearing on October 30.

"A lot of brotherhood men were all talking about coming here," he said, "and the rumor was that they were here to cut the brotherhood men's throats. I went to Brother Wills and asked him about this and he says, 'No, Sir.' He says, 'Of course, all this conversation goes to Brother Stone' and we walked over to the other side of the room and Brother Wills introduced me to Mr. Peck, or Pack, whatever his name is, and one subject brought on another and he says, 'you know you have no right to interfere with the legislative matters of the brotherhood.' I says, I am aware of that, but this is a free country and I am under no king ruler. As long as I tell the truth I will not be thrown out of the brotherhood. Brother Stone says that nobody that tells the truth was ever thrown out of the brotherhood."

On the following day he said he had spoken to Mr. Stone about it and Stone had assured him that if he told the truth on the stand, "nothing would happen to him."

"Did you take it from that that you were being intimidated?" asked Stone.

"No, Sir," replied the witness.

Mr. Wills declined to cross-examine the witness. Mr. Pack asked if the witness had not come to him and said he was "between two fires." Mr. Trostle assented.

"I called your attention to the by-laws and I told you that you knew as much about it as I did," said Mr. Pack. "Yes," replied the witness. He said that neither Mr. Wills nor Mr. Pack had talked to him in a threatening manner. Asked by Mr. Stone how he happened to go to Washington he said he had been asked by a road foreman of engines because he had once had to stop his train, about a year ago, when the general manager was aboard, because he could not see a signal on account of the effect of a trolley car headlight shining in his eyes. He said he had been told that he did not have to go and that he was testifying voluntarily.

#### MR. KELLER'S STORY.

O. P. Keller, who runs on the Broadway and Manhattan Limited trains of the Pennsylvania between Manhattan Transfer and Harrisburg, said that his lodge, Division 74, at Harrisburg, had taken a vote on the power headlight question in 1913 when the brotherhood was trying to secure the passage of a headlight bill in the Pennsylvania legislature and that the majority of its 145 members had voted against the high-power light. His first trial on charges preferred against him by Mr. Stone came as the result of a conversation in the lobby of the Pennsylvania legislature in 1913 with Charles Reese, secretary of the brotherhood's Pennsylvania legislative board. He said he had gone into a hearing room where about 100 or 125 locomotive engineers were giving testimony against high-power headlights, that he had taken no part in the proceedings, but that afterward, while outside in the lobby, he had gotten into an argument with Reese by saying that it was unfair to "force something on the engineers they didn't want."

"In the meantime," he continued, "while we were arguing there, Senator Beidleman, from our town, came in and heard the argument. Senator Beidleman said to Reese, 'You are a damned liar, you told me that all of the men on the Pennsylvania Railroad or in this state were in favor of high-power headlights and here are my own people, living in my own town, that are not in favor of the power headlights and because you told me that lie, I am not going to vote for the headlight.' Then Mr. C. E. Reese writes a letter to Mr. Stone, of which I have a copy at home, that I interfered with the legislation on the high-power headlight, and I never said beans about it, and so they preferred charges against me and Reese. They couldn't find anything against me and acquitted me. Then Mr. Strode wrote a letter to Mr. Stone that our men were against the high-power headlight and he said it did not matter whether 1 per cent or 90 per cent wanted the headlight, it has got to come."

Mr. Keller also produced a copy of the following letter, written to him as chief engineer of Division 74 by Mr. Stone under date of July 14.

"I am in receipt of your letter of July 4 in reference to the charges preferred against Brothers McClintock and Martin by the Executive Committee of the Pennsylvania Legislative Board, and also have a letter from the Secretary-Treasurer in which he informs us that the committee found these members not guilty. This is a new idea to me, for I have always understood and have always ruled that the members present at the meeting when the member was brought to trial, after both sides of the case were presented, decided the guilt or innocence of the accused, but it appears in this case that the Investigating Committee had taken that duty upon themselves. There is no question but what the action in the McClintock and Martin cases was a white-wash pure and simple, and if the members of Division 74 think we are going to accept it, they are very much mistaken.

"You say in regard to the charges preferred against Brothers Keller and Bliss: 'I want to tell you that I am one of them, and I would like to tell you that 95 per cent of the men on my division do not want an electric head-light because the Pennsylvania Railroad is too much congested, because we have from four to six tracks, and in yards as high as fourteen to sixteen and thirty tracks entering train sheds, which would make it impossible for men to see the signals, therefore causing them to have accidents, not because they wanted to but because the lights will blind you so you cannot see. I am speaking from experience as I run up against trolley cars between different points, and positively you can't see any signal when these lights shine in your face. It does not say that if men of the B. of L. E. present bills in the legislature that is detrimental to me or will make a criminal out of me, that I have no right as a citizen to protest against such legislation.'

"When you joined this organization you took an obligation to abide by all the rules and regulations. One of them is the will of the majority,

and you must abide by that as long as you retain membership in the organization regardless of your personal opinions. You have no right either as an individual or member of the organization to any way interfere with the legislation introduced for or being supported by the legislative representatives of our organization, and I want to say to you, before we are through with this, you and some more members of Division 74 who feel that they are a law unto themselves, will find that they are mistaken. We have had about all of this kind of work that we will tolerate from Division 74, and can assure you that if they do not comply with the law both in spirit and letter, we will not hesitate to use our authority and let the next convention decide it."

Mr. Keller said he did not know anything about the proposed order of the Interstate Commerce Commission until last January, when he read of it in the Engineer's Journal, and that he had immediately written a letter to the commission, asking it to give careful consideration before requiring the high-power light. He told the commission that the engineers on the Pennsylvania did not want it, but were afraid to testify because if they did so they would be expelled from the brotherhood. He had mentioned the fact that many cities have prohibited the use of high-power automobile lights. "If you have an automobile yourself," he said, "you can realize the situation." He had also enclosed a copy of the circular written by Stone, warning members not to interfere with headlight legislation. Mr. Stone identified the circular and said he would say the same thing today. Mr. Stone asked if he had not written the letter to the commission after having been expelled from the brotherhood and Mr. Keller said that he had been expelled for joining the Pennsylvania Mutual Beneficial Association.

"Which was an organization to disrupt the B. of L. E., was it not?" said Stone.

"No, sir, that is only a notion of yours," replied Mr. Keller.

Mr. Keller also said that the organization was not a labor organization. Mr. Stone asked if it did not have a grievance committee to get men reinstated.

"Well, Mr. Stone," said Mr. Keller, "I get as many back individually as your organization when they get in trouble."

"That is because you stand in with the company, isn't it?" asked Mr. Stone.

"I had better stand in with the corporation I work for than to stand out with them," replied the witness.

Mr. Stone asked if the headlight bill had not been recommended by a majority of the brotherhood's divisions in the state.

"It is a question in my mind whether it is honestly done," replied the engineer.

"Under the law, it would have to be before they could legally present it, would it not?" asked Mr. Stone.

"No, I would not like to say that, there is so much trickery going on today."

J. A. Foertsch, an engineer on the Philadelphia & Reading, was asked by Mr. Stone how the engineers had been picked who had gone to New York for the tests. He said his superintendent of motive power had called him on the 'phone and asked him if he wanted to go to the test and testify at Washington, saying it was entirely optional whether he should go or not. He had been asked in a similar way to get six men to go to Harrisburg that objected to electric headlights, but that they were not required to go. Mr. Stone asked if he had not found out by experience that a railroad employee had better agree to what the officers wanted. The witness replied that there were a good many men on his road who had disagreed with the officers and were still in service.

The engineers running on railroads entering New York City who testified were unanimous in opposing the high-power headlights in multiple track territory with many signals. One engineer said he would be glad to ride behind an electric headlight if none of the passing engines were so equipped. Mr. Keller said that, while he had never operated a locomotive equipped with an electric headlight, he encountered trolley cars equipped with electric headlights almost every evening and that the light shining in his eyes made it impossible for him to see anything for a time. The

motormen often turned out the lights out of consideration for him, he said, but he has experienced the same trouble on account of automobile lights on the adjacent highways. He runs as fast as 70 miles an hour at times and said that under such conditions he did not want anything to distract his attention from the signals. In fact, he said, he could see his signals better if there were no headlight. He also described his experience at a test on the New York Central, saying that he could not see classification signals or rear end markers on passing trains, and that once when a passing train got between him and three electric headlights on three engines in a group, he was unable to see it at all. He said that if dimmers were used on his line when passing other trains or stations; it would have to be on so much of the time that there would be no object in having the high-power light or else he would forget to use the dimmer.

Similar testimony was presented by other engineers, who said they had been given an opportunity to go to New York to the test and also to go to Washington to testify, but that in both cases they had been given the option of staying away. J. R. Ewing, an engineer on the Pennsylvania, said: "I came here voluntarily for the purpose of protecting myself and the public against a device that means death." Most of the witnesses said that when running at high speed they would be unable to bring their trains to a stop within 1,000 feet, in case they did see an object on the track, especially as in most cases they would not care to put on the brakes until they were sure there was real reason for doing so. On cross-examination Stone and Carter endeavored to secure admissions that the witnesses were testifying under some sort of compulsion. They also emphasized the fact that the witnesses had not in most cases operated locomotives equipped with electric headlights.

F. T. Bentley, superintendent of motive power of the Chicago & North Western, which uses electric headlights, testified that the high-power lights were satisfactory under certain conditions, but that he did not approve of them for congested suburban territory, such as that of his road in Chicago and of the eastern roads running into New York and Philadelphia. He suggested that the commission modify its order to impose only a minimum requirement, for example, a light which would enable an object to be seen on the track at a distance of 300 feet, or about the distance obtained with a 250-watt electric light equipped with dimmers. This would enable the roads that desire to use high-power lights to do so without requiring the roads in congested territory to use them. He said the engineers on his road were entirely satisfied with oil lights in switching service.

After the 20 witnesses allotted to the railroad had testified, Mr. Minard said that about 80 engineers had gone to Washington voluntarily and had expressed a desire to tell the commission what they thought of the attempt to impose the high-power headlight on all railroads and he presented a written petition on behalf of 45 engineers and 13 road foremen of engines and locomotive inspectors, representing a combined service of 1,063 years as engineers and 338 years as firemen, asking the privilege of being heard. Mr. Minard said that their testimony was especially important as in all the hearings on the headlight question the statement had been made that the railroads could not get engineers to testify against the high-power headlight. Mr. Carter said that the brotherhoods could not afford to be placed in the position of objecting to additional witnesses being heard, but that the railroad attorneys were presenting the petition with a view to injunction proceedings if the commission should decline to hear the additional testimony. He asked the commission to conduct additional hearings at Chicago and St. Louis and to take the testimony of engineers in those cities who had had experience with high-power lights. Mr. Minard said that the request was not made solely for the record. He asked that the question of giving these engineers an opportunity to be

heard be submitted to the commission at once. The question was submitted to the commission and the petition was denied. The attorneys for the railroads entered a formal exception.

When the question arose as to whether the hearing should be adjourned to enable those present to go home for election, Mr. Stone and Mr. Carter objected to any adjournment, saying that many of their witnesses had come from a long distance and that, while they would like to vote themselves, they would prefer to stay and finish the hearing. Counsel for the railroads were in favor of adjourning. Mr. Carter said jocularly that the railroads could get their witnesses home in time to vote as they were principally eastern men, while some of the brotherhood witnesses could not get home in time. It was decided that the hearing should be continued.

#### BROTHERHOOD TESTIMONY

Frank McManamy, chief inspector of locomotive boilers of the Interstate Commerce Commission, took the stand on Saturday afternoon as the first witness for the brotherhoods. He said that before recommending to the commission the rule requiring a headlight which would enable a dark object the size of a man to be seen for a distance of 1,000 feet down the track, he had made such investigation of the subject and such tests as time permitted and that he had examined the headlight laws of 31 states, mostly in the west and south. Most of these laws, he said, were drawn in such a way as to require electric headlights, while some specifically prescribed electric headlights. About half of them were based on a prescribed candlepower requirement and about half prescribed the distance at which an object could be seen. He had chosen the distance basis, because he said this made the rule enforceable, as apparatus for the measurement of candlepower was too cumbersome for inspection purposes. He emphasized the fact that the order permits the use of dimmers to reduce the intensity when passing stations or other trains and he felt that the rule had been drawn in such a way as to meet all normal conditions of weather, operation and climate. He described a number of tests conducted on the Chicago & North Western with electric headlights, in which he had no difficulty in reading signals. He also described the tests conducted on the New York Central on September 28, saying he thought the conditions were not entirely favorable, especially as to the observation of men on the track, as they were partially obscured by shadows and curves. However, he thought this was the least important feature of the tests because he thought the lights used were of even greater intensity than that required. He said that it was raining intermittently during the tests, that he had not been consulted in detail about the arrangements for the tests, and that he had been given no opportunity to inspect the lights on the night of the test. He said he had experienced no difficulty in reading signals. Asked if he thought that the railroad officials who opposed electric headlights were mistaken, he said he did think so or he would not have recommended the rule, but that he had preferred to get his material from roads on which headlights are used rather than from the roads that do not use them.

Under cross-examination by R. S. Sharp, president of the American Gas Accumulator Company, Mr. McManamy denied that the commission's order discriminated against acetylene headlights and said that any light could be used that met the requirements. He said the commission had never stipulated electric headlights. Asked if he was opposed to any change in the rule, Mr. McManamy said he was not if it could be shown that change was in the interest of safety.

Mr. Sharp asked Mr. McManamy if he had been or was now a member of the Brotherhood of Locomotive Engineers. Mr. McManamy said he did not think he was called upon to answer the question.

John McManamy, assistant chief inspector of locomotive boilers, described his experience at the tests at New York

and said that he had found no difficulty in reading signals, but that he thought the lights were not in proper condition. He also described his experience as a locomotive engineer operating behind an electric headlight and said he had had no difficulty.

A large number of engineers employed on western railroads that have used electric headlights for years testified as witnesses for the brotherhoods and expressed a preference for electric headlights, saying they had never had any difficulty in reading signals and that they believed that the high-power light was a safety device. They also said they had never experienced any difficulty because of phantom signal indications caused by the reflection from signal roundels. An engineer on the Chicago & North Western said that their lights were focused so that the beam of light strikes the track at a distance about 300 feet in front of the engine so they do not shine directly into the eyes of an engineer on the opposite train. One engineer testified that the electric light tends to obscure a signal light when it is close to it, but that it does not occur until after there has been an opportunity to read the signal correctly from a distance.

The brotherhoods completed their case Tuesday afternoon without giving any rebuttal testimony to the charges of intimidation and coercion.

R. B. Kendig, chief mechanical engineer of the New York Central, and D. F. Crawford, chairman of the Headlight Committee of the American Railway Master Mechanics' Association, and general superintendent motive power of the Pennsylvania Lines West, gave rebuttal testimony for the railroads on Wednesday morning. Mr. Crawford stated that he would never take the responsibility for putting electric headlights on any road and that the danger increased in the proportion to the density of traffic, the number of trains and the number of signals. He stated that a proper rule would prescribe the minimum that would be suitable under the most congested conditions and allow each road to use more intense light if desired.

Oral arguments will be heard in Washington on November 27.

### CLASP BRAKES FOR HEAVY PASSENGER EQUIPMENT CARS\*

By T. L. Burton

Equipment Department, New York Central

The first requirements of a power brake are to stop the vehicle to which it is applied in the shortest possible distance, consistent with maximum rail adhesion, during emergency braking, and in the minimum distance, consistent with accuracy and smoothness, during service braking, all of which is largely dependent upon the type of equipment employed, the manner in which it may be operated and the braking ratio (percentage of brake power) that can be successfully used.

The braking requirements for present day heavy steel passenger car equipment can best be appreciated by a careful analysis of the records of a number of passenger train brake tests with the earlier light wooden cars and the heavy steel equipment of today, and for those who care to make such an analysis the paper† which was presented by S. W. Dudley at the February, 1914, meeting of the American Society of Mechanical Engineers is unqualifiedly recommended. For ready reference, however, it might be interesting to state that in 1902 an exhaustive series of brake tests was made on the Pennsylvania Railroad, under the supervision of A. W. Gibbs, with trains consisting of one

\*This paper is to be presented and discussed at the Railroad Section of the annual meeting of the American Society of Mechanical Engineers, New York, Friday morning, December 8, 1916.

†For an abstract of this paper and the discussion which followed, see the issues of the *Railway Age Gazette* for February 13, 1914, page 311, and February 20, 1914, page 352, respectively.

locomotive and comparatively light wooden cars, in which stops were made from a speed of 60 m. p. h. with emergency brake applications in approximately 1,000 ft. In 1903 similar tests were made on the Central Railroad of New Jersey, under the writer's supervision, in which passenger trains consisting of what was then considered modern equipment, were stopped from a speed of 60 m. p. h. in an average distance of 970 ft. Early in 1905 another series of tests was made on the Pennsylvania Railroad with equipment similar in weight and construction to that used in the 1902 and 1903 tests with substantially the same results.

The emergency braking ratio in the Pennsylvania Railroad and the Central Railroad of New Jersey tests did not exceed 125 per cent of the car weight, and a reducing mechanism was employed for automatically reducing the braking ratio during the stops, so that the mean effective ratio was approximately 100 per cent. Based upon results obtained in the three brake tests just referred to, a distance of 1,000 ft. was considered a desirable theoretical emergency stop from a speed of 60 m. p. h. for a passenger train having the ordinary "high speed brake."

In the fall of 1905, closely following the second test of the Pennsylvania Railroad, similar tests were made on the New York Central, under the supervision of C. H. Quereau. The locomotive and cars used in this test weighed, however, considerably more than the ones used in previous tests, and the emergency stops from 60 m. p. h. were over 1,200 ft., in cases where the air brake equipment and braking ratio were substantially the same as had formerly produced approximately 1,000 ft. stops with lighter equipment. Results of the New York Central test immediately established the fact that as the weights of the individual vehicles of which the train was composed increased, the braking ratio would have to be increased, if the length of the stop was to be no greater than was formerly made with lighter equipment, and to meet the requirements of the heavier locomotives and cars the air brake manufacturers immediately developed an air brake equipment with which could be had a

emergency braking ratio of 180 to 200 per cent of the car weight for producing approximately a 1,200 ft. stop from a speed of 60 m. p. h. These tests demonstrated to the entire satisfaction of all who participated in them that the emergency braking ratio for heavy steel cars would have to be not less than 180 per cent of the car weight if the emergency stops were to be made in no greater distance than formerly required for the lighter cars.\*

Realizing that 180 to 200 per cent braking power applied to one side of a car wheel would probably produce ill effects on journals, brasses, trucks, etc., the writer had made a

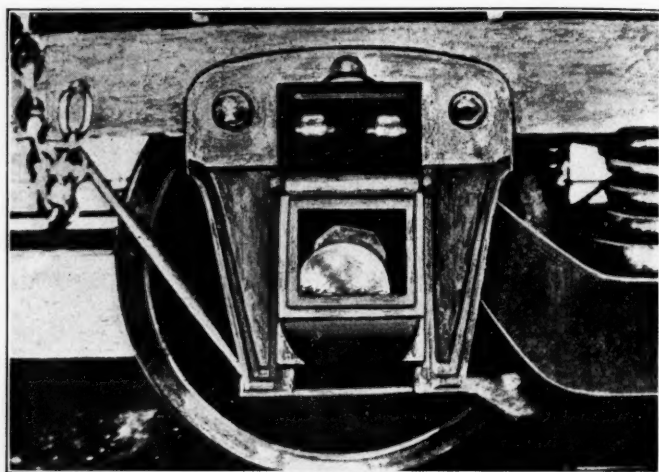


Fig. 2—Tilting and Displacement of Brasses and Journals with Single Shoe Brake; Four-Wheel Truck

careful and thorough analysis of the force action on car journals as affected by high braking forces. It is unfortunate that these analyses are of a character and magnitude which precludes the practicability of reproducing them in a paper of this kind, for they show conclusively the undesirability of applying to one side of the wheel a braking ratio of sufficient magnitude for stopping the modern heavy steel equipment in no greater distance than formerly required for stopping the lighter wooden equipment. A summary of these analyses is, however, shown in Figs. 1 to 5.

Fig. 1 shows a section of an M. C. B. 5-in. by 9-in. journal brass and wedge under a 150,000-lb. car with an average nominal journal load of 11,300 lb. Lines  $R$  and  $R^1$  (Fig. 1) show the resultant of all loads acting on the journals with a single shoe brake, arranged in accordance with the M. C. B. recommendations for such a brake, and with an emergency braking ratio of 190 per cent. ( $R$  and  $R^1$  are for different locations of wheels and direction of rotation.) It will be observed that the lines of action,  $R$  and  $R^1$ , are at a considerable distance below the supporting point between brass and wedge; that is, angle  $A$  is less than angle  $B$  and to push the journals out of the brasses during emergency braking is a natural thing to expect under the conditions stated.

Fig. 2 shows the actual displacement of journals and brasses under service conditions closely approximating those described in Fig. 1. While this photograph is made from a four-wheel truck, the brake arrangement, nominal journal load, braking ratio, etc., are, as previously stated, substantially as shown in Fig. 1.

As resultant  $R$  is affected in direction and magnitude by the distance from horizontal center line of wheels to center

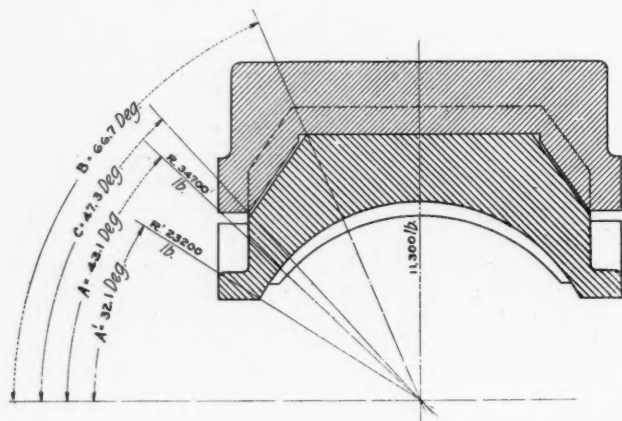


Fig. 1—Force Action on a 5-In. by 9-In. Journal; Car Weighs 150,000 Lb.

higher braking ratio than was obtainable in previous tests with lighter locomotives and cars.

In 1908 another exhaustive series of tests was made on the Southern Pacific with still heavier locomotives and cars, in which it was found that a distance of over 1,300 ft. was required for stopping the heavier trains from a speed of 60 m. p. h. with no greater emergency braking ratio than was formerly required for making a 1,000 ft. stop with the lighter equipment.

In 1909, R. B. Kendig conducted still another brake test on the Lake Shore & Michigan Southern with trains consisting of locomotives and cars closely approximating present day equipment in weight, for which was required an

\*It is not the intention to show by the above references to brake tests the distance in which trains may be stopped in service. In conducting brake tests variations in equipment by which stopping distances are affected are necessarily reduced to a minimum, otherwise the results would not be comparative. The stopping distances referred to should, therefore, be used only as a basis of comparison for different equipments, and it should not be assumed that such stops would be reproduced in actual train service. On the contrary, it may safely be assumed that the stops with service trains should be much longer than test records show.

of brake shoes at face, Fig. 3 was made to show a summary of the analysis of the force action on journals with brake shoes suspended 10 in. from rail (8 in. below wheel centers), which is lower than M. C. B. standard. The braking ratio employed in this case is approximately 160 per cent of the car weight. Angle *A* is still less than angle *B* and displacement of journals and brasses may be expected to result therefrom.

Fig. 4 is a photograph taken at the end of a stop with the car from which the summary analysis shown in Fig. 1 was made, and seems to confirm the analysis so far as con-

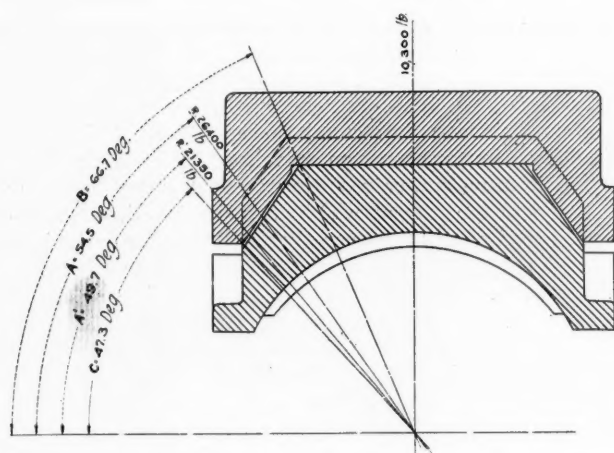


Fig. 3—Force Action on 5-In. by 9-In. Journal; Car Weighs 138,500 Lb.

cerns the effect of the braking load on journals. There seems to have been an open question in the minds of some as to whether the displacement of journals and brasses is controlled by the difference in angles *A* and *B* or *A* and *C*; that is, the points between which the brass is supported by the wedge seems to have been debatable, but a comparison of Figs. 1 and 2, and 3 and 4 should justify the statement that they are supported in their normal position only by the horizontal surface contact with the wedge, and if angle *A* is less than angle *B* the journals will be displaced.

To further check these conclusions an analysis was made of the force actions on a 5-in. by 9-in. journal of a 142,000-lb. car having six-wheel trucks, and a nominal journal load of 10,600 lb., with a service braking ratio of 85 per cent of the car weight and the arrangement of foundation brake gear the same as in Figs. 3 and 4. A summary of this analysis is shown in Fig. 5, from which it will be observed that angle *A* is practically 5 deg. less than angle *B*, and in testing the cars out in road service, it was observed that some journals were displaced during service braking while others were not. The analysis as summarized in Fig. 5 and the observations relating thereto strengthen the belief that if angle *A* is less than angle *B* the journals will be displaced. Also that where angles *A* and *B*, as determined from drawings, practically coincide there may be sufficient variations due to wear or construction of truck and brake details or rocking of brasses and wedges to change either of these angles sufficiently in service to cause the journals to be displaced or maintain a state of equilibrium.

It must be admitted that the high shoe loads applied to one side of the wheel only will produce undesirable results on journals and brasses as shown in Figs. 1 to 5 inclusive, and in addition thereto, it would seem from the discussion which is to follow that the conditions previously described are seriously objectionable from the viewpoint of train braking.

Consideration has been given to a change in brass and wedge design for the purpose of minimizing displacement of journals as referred to in the preceding discussion, but if

this is done, it will still be quite difficult to stop the heavy steel car in substantially the same distance formerly required for the lighter wooden car. While on the other hand, it has been conclusively demonstrated that with a properly designed and constructed clasp brake the maximum available rail adhesion can be utilized in train braking, thereby reducing the emergency stops to a question of adhesion rather than permissible braking ratio. It is, therefore, the writer's opinion that a suitable design and make of clasp brake should be used on modern steel passenger equipment, the advantages of which are, briefly stated, as follows:

#### SAFETY

In case of danger, requiring an emergency brake application, a much shorter stop can be made with the clasp brake than with a single shoe brake, other conditions except those affected by the brake gear being the same in both cases.

If properly designed, manufactured and installed, there is no occasion to disconnect any part of the clasp brake rigging between shopping of cars. The probability of the brake becoming inoperative through a failure to properly replace cotters when disconnecting the brake with the car in transit and the loss of brake pins resulting therefrom is reduced to a minimum.

A thin brake shoe, or the loss of a brake shoe, does not in all cases necessitate cutting out a brake to save the brake beam.

If the clasp brake is properly designed, manufactured and applied to the car it will be practically impossible to adjust the rigging so as to impair its efficiency or interfere in any way with its proper operation.

The axles and truck frames, in addition to performing their usual functions, become safety hangers for the major portion of the brake rigging, thus reducing to a minimum the possibility of derailment that might be caused by brake

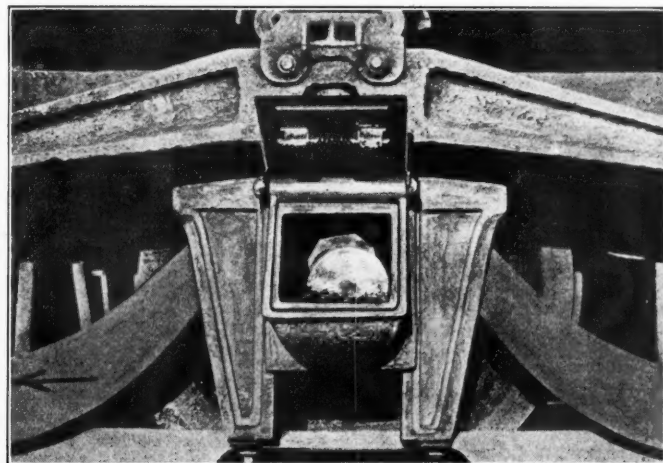


Fig. 4—Tilting of the Truck and Displacement of Brasses and Journals at Stop with a Single Shoe Brake; Six-Wheel Truck

rigging dropping on the track in case of failure of the truck brake gear.

While the possibility of disconnected brake parts dropping on the track is greatly reduced in comparison with the single shoe type of brake gear, the danger is further reduced on account of the clasp brake parts being much lighter than those of the single shoe type.

#### ROUGH VERSUS SMOOTH TRAIN HANDLING, ACCURACY IN MAKING STOPS, ETC.

Many modern passenger trains are, on account of the inherent shortcomings of the "single shoe" type of brake, extremely difficult to handle smoothly. Careful investigation

of the complaints of roughly handled passenger trains indicate that most of these troubles are due largely to non-uniform braking power and the *time in which it is developed*, as a result of improper piston travel.

In service braking at low speeds, whether for the purpose of stopping from such speeds or for completing stops from high speed, such as making a *second brake application* as the stopping point is approached, the brake power should be light and the retardation resulting therefrom must be developed slowly, or simultaneously on all cars, if smooth handling is to be insured. Smooth service stops from all speeds are also contingent upon the flexibility of the brakes.

The seriousness of slack action shocks are greater than in former years on account of the greater average weight of cars and increased length of trains, and the chances for producing them are much greater with the single shoe brake than was formerly the case with lighter cars and shorter trains.

Contrasting the desired rate at which the braking power should be developed at low speed, making service or emergency stops from high speed in a minimum distance necessitates developing a high nominal braking power, and in addition thereto it must be developed rapidly. The rate at which both service and emergency braking power is developed is largely dependent upon piston travel, and with a view to producing the best results under all conditions the automatic brake is built on the principle of maintaining, as near as practicable, 8 in. piston travel at all times and

The results just cited are due to the fact that with the single shoe brake the piston travel is practically proportional to the cylinder pressure developed, whereas with the clasp brake, with a shoe on each side of the wheel, the horizontal wheel or shoe movement relatively to the brake cylinder is reduced to a minimum, and such movement if produced from any cause will have no effect on the piston travel. Moreover, with the clasp brake the shoes are located sufficiently close to the horizontal center line of wheel centers to obviate the *pulling down* of truck frames and variations in piston travel resulting therefrom.

The removal of worn shoes and their replacement by a given number of new shoes without readjustment of slack, as is frequently done on long runs, will not affect the piston travel with the clasp type of brake to the same extent as would occur with the single shoe type of brake.

The only remedy that can be offered for the difficulties arising from improper piston travel, which so seriously affects the braking power resulting from a given brake pipe reduction and the rate at which it is developed, is to apply a truck and body brake gear that will substantially insure uniform piston travel under all conditions of speed and cylinder pressure. The use of the clasp type of brake rigging with body brake gear to suit will, to a large extent, accomplish these results and restore the flexibility of brake operation which existed prior to the adoption of extremely heavy cars and long trains of the present day equipped with single shoe brakes.

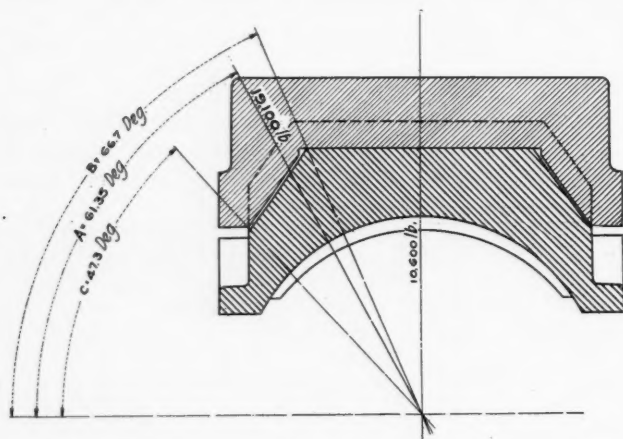


Fig. 5—Force Action on 5-In. by 9-In. Journal, with Service Brake Application; Car Weighs 142,000 Lb.

under all conditions. As an example, if, during service braking at low train speeds, the piston travel resulting from 10 lb. brake pipe reduction is only 5 in. instead of 8 in. (with some brake riggings it is 5 in. or less) the braking power will be fully 100 per cent greater than with the predetermined standard piston travel of 8 in., and with the shorter travel a 10 or 15 lb. reduction will practically equalize the auxiliary reservoir and brake cylinder pressure, thereby materially reducing the flexibility of the brake. While the vibration of the car may cause the 5 in. piston travel to increase to practically normal before the stop is completed, it will not do so except when stopping from high speed. Moreover, if the travel does increase before the stop is completed it will contribute nothing to smooth handling, as the shock will have occurred while the travel was short.

Other things being equal, the clasp brake will develop a higher percentage of braking power than the single shoe brake during heavy service or emergency applications, but for light service braking at low speed the brake power developed from a given brake pipe reduction is much less with the clasp brake than with the single shoe brake, and it is developed at a much lower rate, thereby insuring smoother train handling than can be had with the single shoe brake.

#### IMPROVED RIDING QUALITIES OF EQUIPMENT

The high brake shoe loads developed on one side of the wheels with a single shoe brake produce a binding effect between pedestals and oil boxes, which interferes with the proper action of the truck springs during an application of the brakes, and when the shoes are hung low, as is necessary with the ordinary six-wheel truck and single shoe brake, the pulling down effect of the truck defeats in many cases the purpose of the truck equalizing springs. This binding between pedestals and oil boxes and the increased load on truck springs cause the car to ride hard when brakes are applied. These evils do not exist with the clasp brake.

#### ELIMINATION OF HOT BOXES

With the single shoe type of brake rigging it will be observed that the high pressure exerted by the shoe on one side of the wheel causes the tilting of brasses sufficiently to lift one side of the brass a considerable distance away from the journal (see Figs 3 and 4) so that a wide space is open for waste to be caught between the brass and the journal when the brake is released and the brasses and journals resume their normal position. Investigation has shown that waste has been found wrapped around the journal, and that the collars on the axles are forced against the sides of the boxes. Further, these effects are not confined to emergency applications, but will also be noted in service applications of the brake and are all in the direction of producing hot boxes, while the unequal distribution of braking power and binding between boxes and pedestals has a tendency to cause slid flat wheels.

#### DECREASE IN MAINTENANCE COST AND BRAKE SHOE COST

While the principal advantages inherent in the clasp brake, of greater flexibility in service braking, etc., are outlined in the foregoing and the primary consideration for its adoption must be the increased emergency efficiency over the single shoe type of brake, providing as it does for the possibility of greatly shortened stops, with a lesser tendency to slide wheels, and consequent increase in safety, the clasp brake will also, due to the principles involved in its design and construction, show a decided decrease in cost of maintenance, not only in the brake rigging itself, but a substan-

tial decrease in the cost of brake shoe material for equal amounts of energy dissipated.

#### COST OF TRAIN OPERATION

Investigation has developed the fact that with the single shoe type of brake on modern passenger equipment cars and the piston travel adjusted to proper limits, approximately 35 per cent of the available tractive effort of the locomotive was consumed in pulling the train against the effect of brake shoes dragging on the wheels with the brakes released. (See M. C. B. Assn. Proceedings, 1910, page 97, paragraph 3.) With the clasp type of brake and the resulting increased shoe clearance, this loss is eliminated, leaving better maintenance of schedules and corresponding decreased cost of train operation.

#### CONCLUSIONS

In considering the application of clasp vs. single shoe brakes to the modern heavy steel passenger car of today the advantages of the former over the latter, as enumerated above, are but secondary to the primary question to be settled, namely: Are the present day trains to be stopped from given speeds in no greater distance than was required 10 to 15 years ago for stopping the lighter wooden cars? If so, the question of whether or not an efficient clasp brake should be used on such trains is conclusively settled. The collision energy of the heavy steel passenger train as compared to the lighter wooden train has increased directly in proportion to the increased weight, and in geometrical proportion to the increased speed, in cases where speeds have been increased, to say nothing of the increased density of traffic. It would, therefore, seem that the use of a clasp brake is essential in successfully controlling the speed of present day or future passenger trains, and without regard to nominal increase in first cost or multiplicity of parts of brake gear resulting therefrom.

The foregoing discussion on the relative performance of the clasp and single shoe brake is with the distinct understanding that the former is designed upon a scientific engineering basis and is constructed and installed in accordance with the principles involved in the design, for while the claims made for the clasp type of brake have been conclusively demonstrated by exhaustive tests and road service, it has likewise been demonstrated that where the clasp brake is improperly designed or carelessly manufactured and installed the results obtained in service are in many respects less desirable than with the single shoe brake.

### WASHINGTON CORRESPONDENCE

#### ANOTHER SHREVEPORT CASE

The Interstate Commerce Commission has before it another case partaking of the characteristics of the Shreveport case, involving discrimination against interstate shippers caused by lower rates for intrastate transportation made by the authority of a state. In this case the lower rates were made by the general assembly of North Carolina, which, in October, 1913, adopted an act by which a schedule of rates was prescribed for the transportation of traffic between points in that state. The governor of the state was empowered to appoint a special commission to review the rates established and to recommend such changes as it thought necessary in order to place the rates on the proper level. The commission was appointed and after investigation suggested some changes, which were adopted. The revised rates were approved by the governor, who proclaimed them effective on October 13, 1914. The railroads published the rates proclaimed, which are still in effect, under protest directed in writing to the governor of North Carolina and to the Interstate Commerce Commission.

The present case was brought before the Interstate Commerce Commission by a complaint of the Chattanooga Sewer

Pipe & Fire Brick Company, which manufactures sewer pipe and fire clay products at Chattanooga, Tenn. The complainant alleged that the rates on sewer pipe from Chattanooga to North Carolina points were much higher than the rates applicable locally within the state of North Carolina, which were available to one of its principal competitors located at Terra Cotta, N. C., and that it was, therefore, unable to dispose of its product in North Carolina at a profit. The railroads conceded that the rates from Chattanooga to North Carolina points ought not to be higher than the rates in North Carolina for equal distances and that the difference, if any, from a transportation standpoint, is in favor of the transportation from Chattanooga. The complainant said it was immaterial whether the uniformity of rates sought was brought about by increases in the North Carolina state rates or by reductions in the rates from Chattanooga.

The commission in a decision just issued finds that the relation between the interstate and the state rates subjects the complainant and its traffic and the city of Chattanooga to undue prejudice and disadvantage, but says that, as the present record affords no basis for a finding as to the reasonableness of the rates which should be applied, a further hearing will be ordered on that question.

#### CAR SUPPLY INVESTIGATION

Formal and informal complaints having been filed with the Interstate Commerce Commission from all sections of the country concerning the supply, exchange, interchange and return of freight cars, the commission announced on Saturday that it had decided to broaden its investigation of the car shortage situation, which was the subject of an informal conference at Louisville before Commissioner McChord on November 3 and 4, into a general investigation covering all phases of the subject in all sections of the United States. A formal order was issued for such an investigation "concerning the supply, exchange, interchange and return of freight cars and all rules, regulations and practices relating thereto, with a view of issuing such order or orders as the commission may deem appropriate."

A copy of the order was served upon all railroads and a hearing was ordered to be held at Louisville on Wednesday of this week before Commissioner McChord. Further hearings in various parts of the country are to be announced later.

The hearing before Commissioner McChord last week was called particularly for the purpose of hearing from shippers and representatives of the lines reaching the Atlantic seaboard and the Gulf whose facilities have been so heavily taxed by the abnormal volume of export traffic. At the hearing Commissioner McChord suggested that the railroads endeavor to agree among themselves regarding methods which would tend speedily to ameliorate the present conditions. To this the railroad representatives replied, after a conference, in a communication stating that the immediate action desired by the commission in the present situation may best be obtained by request upon A. H. Smith, president of the New York Central; Fairfax Harrison, president of the Southern, and R. H. Aishton, president of the Chicago & North Western, chairmen of the conference committees representing, respectively, the eastern, southern and western lines, to meet with Commissioner McChord with a view to designating a committee with power to represent the carriers in dealing with the commission. The railroads have already indicated one remedy for the present conditions by filing tariffs with the commission, effective on December 1, on the recommendation of the committee on relations between railroads of the American Railway Association, providing for a graduated increase in demurrage rates, together with a modification of the average agreement. Such a plan was proposed to the commission about a year ago, but the commission declined to accept it on short notice in view of the opposition of the shippers.

The general investigation undertaken by the commission will give the railroads an opportunity to renew their arguments for some plan which will tend to discourage the use of freight cars as warehouses.

#### TWO UNDELIVERED VOTES

If President Wilson expected that the four pens with which he signed the Adamson law and which he is understood to have presented to the heads of the four brotherhoods, were to be used in marking Democratic ballots, he was disappointed in at least two instances. W. S. Stone, grand chief of the Brotherhood of Locomotive Engineers, and W. S. Carter, president of the Brotherhood of Locomotive Firemen and Enginemen, were too busy in Washington looking after their rule requiring the railroads to equip their locomotives with high-power headlights to go home and vote. The railroad attorneys requested an adjournment of the headlight hearing over election day, but this was opposed by Stone and Carter, who said that while they did not like to lose their votes they were more anxious to finish the hearing. The hearing was, therefore, continued all day Tuesday. Possibly the brotherhood leaders felt that they were paired with the railroad lawyers. Mr. Carter made the point that if the hearing was adjourned the engineers who had come to Washington as witnesses for the railroads, being from eastern roads, could get home in time to vote, while the brotherhood witnesses, being from western roads, would not have time to go home anyway. It is said that a straw vote of the 78 engineers from the eastern roads, taken while on their way to Washington, showed that exactly half of them were for Hughes and the other half for Wilson; but when Wilson's reelection was reported during the hearing Wednesday, all the noise came from the brotherhood side of the room.

#### ILLINOIS PASSENGER FARES

The Interstate Commerce Commission Wednesday issued a supplemental order in the Business Men's League case for the purpose of making more specific its decision ordering the railroads to remove the discrimination against St. Louis & Keokuk caused by two cent fares in Illinois, while the interstate fare is 2.4 cents. The original order was confined to the territory intermediate to Chicago, St. Louis and Keokuk. The supplemental order holds that any adjustment of fares as between St. Louis or Keokuk and Illinois destinations generally, which would permit the defeat of lawfully established interstate fares through purchase of tickets upon combination of state and interstate rates, would continue the illegal burden on interstate commerce. It would seem that order requires railroads to advance passenger fares throughout Illinois.

**THE SUPER-ZEPPELIN.**—The following are the leading particulars of the super-Zeppelin L 33 which was brought to earth in England on September 23: Length, 680 ft., total weight with crew and officers 50 tons; six 240 horsepower engines with a speed of 1,600 revolutions per minute, three engines being placed in one gondola and one in each of the others; estimated quantity of petrol carried 2,000 gallons, and gas capacity of the envelope 2,000,000 cubic feet. The vessel carried seven or eight guns, including five Maxims and sixty bomb droppers.

**RUBBER INSULATION OF WIRE.**—Numerous tests have been made by the United States Bureau of Standards in connection with an investigation to determine the effect of dry heat on the physical properties of the rubber insulation of wire. This work is being carried out in collaboration with the testing department of the Pennsylvania Railroad and other laboratories identified with the American Society for Testing Materials, the object being to develop an accelerated test for insulated wire that will indicate the probable life of the wire insulation under normal service conditions.

#### SANTA FE TICKET OFFICE AT LOS ANGELES

The Atchison, Topeka & Santa Fe has opened a new city ticket office at Los Angeles, Cal. While, of course, the office equipment is designed primarily to meet the requirements of a busy city ticket office, an attempt has been made to use Mexican adaptations of Spanish architectural designs in such a way as to suggest the spirit so often associated with the Southwest. The walls are of weathered red wood and the counters and wainscoting are finished in dull black enamel. The floor is of marble. There are several paintings of scenes in the Grand Canyon and the Yosemite valley.



Interior View Santa Fe Ticket Office at Los Angeles

The Greek cross and circle of the Santa Fe trade-mark is used effectively as a decoration on the columns and in the mosaic of the floor.

The office is located in the Consolidated Realty building, and we are indebted to J. J. Byrne, assistant passenger traffic manager, for the accompanying illustration.

**ELECTRIC OPERATION ON THE ARGENTINE CENTRAL.**—The opening of the new electric service on the Argentine Central Railway, between the two stations of Retiro and Tigre, was recently undertaken by the President of the Republic. The scheme was projected as far back as 1910, when the company received a favorable report from its consulting electrical engineers in London. The government gave its consent in the following year, and in 1913 orders for the machinery, rolling stock and equipment were placed. The length of the route is about 17 miles, and the third rail system is used. The rolling stock, only a portion of which has arrived in Argentina owing to the war, will consist of 105 coaches—of which but 72 have been received—50 trailer coaches and 55 motor coaches. Each electric coach is fitted with control gear, enabling it to be driven from either end. Each motor is rated at 250 horsepower. The rolling stock is arranged on the unit system, each unit consisting of one motor coach coupled to one trailer. A train consists of from one to six units.

## General News Department

The management of the Wellsville & Buffalo, following a conference with the New York State Public Service Commission, announces that freight trains will be continued in service until November 17.

The Grand Trunk has accepted an award, made by the governmental Board of Conciliation, increasing the pay of track repair laborers 25 cents a day, and to advance the pay of track foremen 20 cents a day.

In the Federal Court at Montgomery, Ala., November 1, Benjamin F. McKee, found guilty of complicity in the robbery of a train of the Louisville & Nashville, at Greenville, Ala., in July, 1915, was sentenced to 25 years imprisonment.

"Barber pole" signs have been painted on all Southern Railway crossing gates in accordance with the standard recommended by the American Railway Association. The stripes are alternate black and white, eight inches wide, running at an angle of 45 degrees.

The Queensboro subway, extending from the Grand Central Terminal, New York City, across the East River about two miles, to a terminus in Long Island City, has been extended northward from its eastern terminus to the Plaza at the east end of the Queensboro bridge (Sixtieth street) about two miles; and the running of trains over the extension was begun on Sunday last.

The Southern Pacific has extended its pay relief allowance for its employees who are in actual army service with the National Guard until December 31, 1916. While such employees are serving in the army, the company allows to those married full pay; to those unmarried, with families dependent upon them for support, three-quarters to full pay, according to controlling circumstances; to those unmarried, without dependent families, half pay.

As railway employees are not allowed to strike as a body in Mexico, the men in the repair shops along the northeastern Mexican roads, recently hit upon the novel idea of striking in small groups at a time until everybody was out. The chief grievance of the men, it is said, is that they were paid in paper notes. As this currency fluctuates greatly the men insisted upon being paid in gold. Their demands were refused by the Carranza authorities, and the strike ensued.

The Louisville & Nashville has issued instructions to passenger conductors providing for the convenient sending of telegrams by passengers on trains. Passengers may hand telegrams to conductors, porters, sleeping car conductors, flagmen or brakemen and they will be delivered to the agent at the first open telegraph office. The trainmen are to note on such telegrams the date, the number of the train and their initials. It is assumed, apparently, that all such messages will be sent collect.

The Pennsylvania Railroad, reporting that in the eight months ending September 1 thirteen people lost their lives and 104 were injured at grade crossings on the lines of the Pennsylvania System, says that the drivers of no less than *twenty-three* motor cars smashed their machines into the sides of trains that were actually part way over the crossings. Four lives were lost in this way and fifty-one persons were injured. Six motorcycles, two bicycles, and four horse-drawn vehicles were similarly driven into the sides of trains.

According to a statement issued by Thomas W. Hulme, general secretary of the Presidents' Conference Committee on the Federal Valuation of the Railroads, valuation work was under way September 30, 1916 on railways with a total length of 132,783 miles. On these roads the field inventory has been made of track on 82,394 miles of road; 57,836 miles with respect to bridges; 54,857 miles with respect to buildings; 54,846 miles with respect to signals, and 89,828 miles with respect to telephone and telegraph property. Also 27,341 miles of line have been inspected with reference to "adjacent similar lands."

Local agents of the Baltimore & Ohio from western cities are this week making a tour of inspection of the company's export facilities on the Atlantic seaboard—Baltimore, Philadelphia and New York. Similar trips are to be arranged on the company's lines for the agents in every city, so that they may have an opportunity to learn at first-hand how the traffic which passes through their offices is handled in the large centers of the east. J. K. Graham, superintendent of station service, is in charge of the party.

To reduce to a minimum grade crossing accidents caused by automobilists crossing ahead of passenger trains, the Northern Pacific has printed circulars under the caption "A Word of Caution to Motorists" which have been sent to all secretaries of state in the northwest with the request that they be distributed when new license plates are sent out. The circular cites government statistics showing the great number of casualties resulting from grade crossing accidents, and figures showing the general carelessness of most automobilists.

An interesting commentary on the present unusual activity among the car builders lies in the tremendous amount of lumber necessary to complete the car orders already placed, aside from those now pending. The situation is resulting in the demand upon the general lumber market for huge quantities of yellow pine, Douglas fir and oak. While no authoritative figures have been compiled, it is estimated that approximately 18,000,000 ft. of lumber will be required to fill contracts for new cars placed within the last week or ten days, and fully another 10,000,000 ft. for the orders now being quoted upon.

Beginning on January 1, 1917, the Grand Trunk will issue annual passes to employees 15 years in the service. If a man is married the pass will include his wife. Each pass will be good over either of the Eastern Ontario or Western lines, according to the respective territory on which the man is employed. Employees who have been twenty years in service will receive annual passes for themselves and wives good over the entire system. Former employees, now on the pension or superannuation rolls will be considered, as regards length of service, the same as employees, and these former employees will be accorded the same pass privileges.

A new dining car has been placed in service on the Illinois Central with improved sanitary features. This car is provided with an efficient ventilating system for the kitchen which prevents all dust and cinders from entering the car and still provides proper ventilation. The receptacle for milk and cream is kept clean by means of a continuous flushing arrangement, and the fish is kept in a separate refrigerator. There is a fan to drive cooking odors to the rear platform, keeping them out of the dining room. The car has no platforms and there are tables for thirty-six passengers. Cars of this type cost about \$30,000 each.

The Grand Trunk Railway of Canada calls attention to the fact that last Friday (October 27) was the sixtieth anniversary of the inauguration of railroad communication between Montreal and Toronto. On October 27, 1856, the company ran its first through train between these cities. The Grand Trunk was incorporated in 1852, and the first section, from Montreal to Brockville, 125 miles, was completed in November, 1855. The first train consisted of three first-class and three second-class coaches. The eastbound train left Toronto at 7 a. m., and the westbound left Montreal at 7:30 a. m., and the running time was 14 hours (334 miles). The first train from Toronto was greeted on arrival in Montreal by thousands of visitors. The Point St. Charles shops were turned into a great banquet hall with seating accommodation for 4,400 guests and every table was crowded. Speeches were made by the Governor-General, the Governor of the State of Maine, and other notabilities. Five months after the opening of the road between Toronto and Montreal night trains were put on.

## REVENUES AND EXPENSES OF RAILWAYS

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses			Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decrease) income last year.
		Freight.	Passenger.	Total (inc. misc.).	Way and structures.	Maintenance of equipment.	Traffic.				
Staten Island Rapid Transit Co.	11	\$46,919	\$41,516	\$91,718	\$8,604	\$5,988	\$694	\$39,732	\$5,000	\$34,732	—\$23,298
Alabama, Great Southern	309	\$331,252	\$118,127	\$494,687	\$46,359	\$89,478	\$14,175	\$129,165	\$17,064	\$182,410	\$69,581
Ann Arbor	294	121,213	240,643	361,856	26,032	36,821	5,598	94,868	13,400	81,468	13,375
Atlanta & West Point	93	56,433	42,463	98,896	13,221	19,203	6,630	32,033	6,706	25,327	50,023
Atlanta, Birmingham & Atlantic	640	208,632	54,673	276,885	45,227	48,159	14,076	94,900	13,100	81,800	11,647
Atlantic & St. Lawrence	167	148,620	33,902	194,734	32,497	26,679	4,191	75,591	9,895	65,696	426,919
Atlantic City	170	95,611	331,114	426,725	25,884	45,267	8,090	167,064	10,000	157,064	205,940
Atlantic Coast Line	4,746	1,747,611	648,641	2,396,252	378,712	515,901	190,565	3,062,883	325,873	2,737,010	14,483
Baltimore & Ohio	4,539	8,100,653	1,629,305	9,729,958	1,320,423	1,997,370	570,357	3,462,904	13,600	3,449,304	182,652
Bangor & Aroostook	632	176,604	64,844	241,448	43,087	38,187	4,012	74,127	9,706	64,421	433,013
Bingham & Garfield	36	282,850	2,869	285,719	28,345	27,674	1,094	34,894	168,850	172,044	3,203
Boston & Maine	2,998	2,926,651	1,718,172	4,644,823	591,060	598,790	43,864	1,914,864	9,100	1,905,764	78,634
Canadian Pacific Lines in Maine	234	53,568	22,765	76,333	30,907	16,607	5,608	32,443	14,250	18,193	4,998
Carolina, Clinchfield & Ohio	283	120,873	20,771	141,644	12,413	28,740	1,967	38,740	14,087	24,653	8,006
Carolina, Clinchfield & Ohio of S. C.	18	4,204	1,337	5,541	408	80	3,073	1,036,204	15,565	70,549	8,006
Central of New Jersey	684	1,992,309	723,683	2,715,992	232,431	494,110	137,515	1,036,204	15,565	70,549	8,006
Central Vermont	411	249,562	116,062	365,624	79,766	60,454	8,776	156,470	62,400	94,070	118,091
Chicago & Eastern Illinois	1,136	1,085,492	298,521	1,384,013	235,593	335,378	22,649	499,847	22,230	477,617	1,457,736
Chicago & Erie	270	656,860	58,810	715,670	78,641	63,811	18,089	238,440	381,026	4,113,466	1,457,736
Chicago, Burlington & Quincy	9,369	7,084,697	2,981,510	10,066,207	1,457,061	1,340,000	137,515	2,638,943	3,487	11,135	15,955
Chicago, Great Western	1,496	999,454	353,187	1,352,641	223,226	237,352	47,194	446,443	29,465	416,978	143,622
Chicago, Indianapolis & Louisville	622	534,655	176,940	711,595	76,069	124,861	21,454	225,714	6,000	219,714	75,277
Chicago, Peoria & St. Louis	255	118,870	29,889	148,759	22,731	35,625	5,906	62,551	292,066	2,247,241	1,027,395
Chicago, Rock Island & Pacific	7,653	4,790,241	1,929,398	6,719,639	7,230,707	1,010,600	133,940	2,227,172	30,763	365,452	108,354
Cincinnati, Hamilton & Dayton	622	803,464	121,088	924,552	1,041,833	129,549	15,505	344,049	9,441	334,608	161,321
Cincinnati, Indianapolis & Western	323	145,641	52,087	197,728	31,043	28,596	6,976	77,579	3,650	73,929	5,029
Cincinnati, New Orleans & Texas Pacific	377	728,192	189,842	918,034	234,936	234,936	23,248	248,361	5,000	243,361	115,698
Coal & Coke	137	75,617	19,579	95,196	27,063	28,527	1,014	38,527	38,500	2,027	2,008
Colorado & Southern	1,102	550,134	199,893	750,027	101,240	143,983	14,418	214,663	7,603	207,059	2,008
Cripple Creek & Colorado Springs	87	98,072	32,384	130,456	12,953	15,849	2,519	34,660	9,441	25,219	16,538
Cumberland Valley	164	224,123	70,807	294,930	31,410	40,047	4,557	84,700	3,963	80,737	120,283
Delaware & Hudson Co.—R. R. Dept.	886	1,774,842	485,032	2,259,874	192,702	485,438	29,222	781,471	58,650	739,121	147,665
Delaware, Lackawanna & Western	955	3,095,617	816,618	3,912,235	540,844	667,091	71,878	1,363,346	232,500	1,130,846	130,740
Denver & Rio Grande	2,577	1,688,877	494,590	2,183,467	317,868	317,868	40,725	557,760	92,000	465,760	18,041
Detroit & Mackinac	383	76,286	36,188	112,474	13,170	18,997	1,926	37,590	6,800	30,790	37,848
Detroit & Toledo Shore Line	81	129,337	66,000	195,337	8,765	7,483	1,667	34,969	3,963	31,006	33,129
Detroit, Grand Haven & Milwaukee	191	177,000	66,000	243,000	29,032	39,675	6,102	132,857	6,000	126,857	14,474
Detroit, Toledo & Ironton	441	179,932	17,986	197,918	23,596	33,991	4,573	84,282	19,000	65,282	54,868
Duluth, South Shore & Atlantic	601	210,087	115,414	325,501	36,104	64,891	7,786	108,060	19,000	89,060	106,453
Duluth, Winnipeg & Pacific	191	118,357	20,817	139,174	15,157	16,579	2,004	45,734	7,157	38,577	50,845
Elgin, Joliet & Eastern	800	1,099,444	46	1,099,490	1,169,411	104,880	6,646	323,665	19,425	304,085	387,807
Erie	1,988	4,452,554	931,423	5,383,977	539,881	1,167,185	93,288	2,059,761	13,761	2,046,000	1,716,785
Fort Worth & Denver City	434	347,656	155,794	503,450	63,254	86,928	7,463	130,761	12,894	117,867	62,937
Georgia	307	177,302	79,449	256,751	27,888	41,951	13,055	95,677	8,831	86,846	53,488
Grand Trunk Western	347	623,000	163,000	786,000	839,172	142,383	18,534	259,074	14,451	244,623	63,112
Great Northern	8,051	5,814,941	1,468,197	7,283,138	958,270	932,959	96,363	1,978,614	116,995	1,861,619	779,828
Gulf & Ship Island	308	135,757	33,893	169,650	16,976	30,112	3,434	47,348	7,140	40,208	8,251
Gulf, Colorado & Santa Fe	1,938	1,071,116	322,375	1,393,491	270,296	198,805	26,597	459,829	44,492	414,337	397,635
Hocking Valley	350	654,266	100,064	754,330	815,692	185,784	8,212	209,771	311,512	41,259	401,688
International & Great Northern	1,160	581,691	219,348	801,039	120,117	165,629	21,854	310,186	30,000	280,186	222,237
Lehigh & Hudson River	97	175,771	5,920	181,691	36,149	20,521	1,436	71,192	5,000	66,192	3,283
Los Angeles & Salt Lake	1,154	617,262	289,289	906,551	88,149	146,276	30,203	256,511	50,173	206,338	21,084
Louisiana & Arkansas	1,379	106,827	18,863	125,690	17,650	17,650	3,635	35,674	8,193	27,481	4,618
Michigan Central	1,803	2,458,160	1,152,973	3,611,133	511,902	595,775	62,845	1,285,579	140,000	1,145,579	332,579
Mineral Range	120	88,942	3,913	92,855	20,400	16,835	398	36,664	3,300	33,364	11,536
Minneapolis, St. Paul & S. M. R.	4,227	2,189,304	697,629	2,886,933	365,276	365,276	52,650	815,859	65,166	750,693	1,388,671
Missouri, Oklahoma & Gulf of Texas	134	23,351	514,174	537,525	2,614	1,584	1,584	10,261	188	9,073	4,691
Missouri Pacific	3,931	2,408,053	514,174	2,922,227	605,359	77,617	77,617	994,496	109,000	885,496	729,879
Mobile & Ohio	1,160	121,340	16,776	138,116	122,671	244,277	33,870	336,556	38,201	298,355	198,496
Nevada Northern	165	171,713	12,839	184,552	189,551	22,829	717	29,440	6,309	23,131	111,798
New Orleans, Texas & Mexico	191	82,268	16,382	98,650	18,854	18,879	5,658	28,734	33,635	4,100	3,155
New York Central Railroad	6,093	11,961,229	5,199,312	17,160,541	1,957,827	3,969,266	290,843	5,826,970	69,245	5,757,725	1,899,325
New York, Chicago & St. Louis	571	1,076,858	167,731	1,244,589	99,886	49,427	49,427	292,265	42,000	250,265	5,291
New York, Ontario & Western	568	478,316	346,657	824,973	121,344	121,344	9,137	297,224	27,000	270,224	29,505
New York, Susquehanna & Western	140	191,515	46,463	237,978	31,390	31,390	2,183	114,598	14,100	100,498	5,988
Norfolk Southern	908	256,333	127,251	383,584	66,306	66,306	9,834	135,233	12,528	122,705	108,674
Northwestern Pacific	507	253,348	206,042	459,390	44,353	50,677	5,067	102,434	1,555	100,879	34,248
Oregon Short Line	2,247	1,799,735	486,887	2,286,622	281,979	201,777	32,727	526,387	23,600	502,987	1,722,008
Oregon-Washington R. R. & Nav. Co.	2,053	1,245,291	436,359	1,681,650	1,827,624	1,827,624	49,459	536,387	1,560	534,827	1,524,598
Panhandle & Santa Fe	670	419,602	110,092	529,694	69,362	80,059	3,949	118,165	1,452	116,713	165,496

### August Gross Earnings \$1,418

The Interstate Commerce Commission's statement for the month of August, summarizing the railroads' monthly reports of operating revenues, shows average gross receipts of \$1,418 per mile, as against \$1,190 for August, 1915. Operating income averages \$476 per mile, as compared with \$375.

### Street Car Disaster at Boston

At the drawbridge over Fort Point Channel, Boston, Mass., near the South Station, on the evening of November 7, a street car crashed through the gates and fell into the water, landing on the bottom of the channel in a nearly vertical position with many passengers crowded into the bottom end. Forty or more persons were killed, most or all of them being drowned. The conductor and the motorman jumped off and saved their lives.

### Test of Adamson Law

The Union Pacific filed suit in the Federal Court at Omaha last Wednesday to test the constitutionality of the "eight-hour" law recently passed by Congress. Thomas S. Allen, United States District Attorney, and four Union Pacific trainmen, representing the different railroad brotherhoods, were made parties defendant. The bill of complaint alleges that the law is unconstitutional because it is not a proper regulation of interstate commerce, because it violates the guarantees of the fifth amendment to the Federal Constitution, and because it is unworkable as applied to existing conditions.

### Locomotive Tests at University of Illinois

The Engineering Experiment Station, of the University of Illinois, has entered into a co-operative arrangement with the International Railway Fuel Association, and the United States Bureau of Mines, to conduct tests with various sizes and grades of coal used for fuel. The Baltimore & Ohio has lent one of its newest Mikado type locomotives for the purpose. Samples of coal to be used will be taken from Illinois mines and will be graded according to present commercial sizes, ranging from the so-called slack and run-of-mine up to the commonly used "2 by 6 lump." Later tests will be made with pulverized coal, blown into the fire-box by means of a specially designed blower. Tests will be made with both hand firing and automatic stoker firing.

### The Louisville Freight Car Conference

The informal conference on freight car shortage held at Louisville, Ky., on November 3 and 4, by Commissioner McChord, was followed by a formal conference beginning November 8. The first day was devoted to an examination of the Kentucky and Ohio coal operators, the representatives of public utilities, the grain shippers and the malleable iron, brick and clay manufacturers of the Middle West and the South. All testified that the car shortage was acute and that it was seriously cutting down the production of their plants; and in some cases threatening a suspension of business altogether. L. A. Anthony, superintendent of Car Service of the Boston & Albany, was examined. He admitted that his road had 28 per cent more cars than it owned; this because eastbound traffic is much heavier than westbound. Every effort is made to return foreign cars. In the first five days of November his road received 9,774 cars and delivered to connections 9,539. There is no congestion at Boston as no cars with export lading are accepted unless vessel room has been arranged for.

At the informal hearing last week, officers of the Louisville & Nashville, the Illinois Central and the Burlington were examined. It was disclosed that the railroads are not returning cars to the owning roads, thus violating car service rules 1, 2, 3 and 4 of the American Railway Association. The Louisville & Nashville defended its embargo on the movement of coal in its own cars north of the Ohio river, showing that on October 28 it had in its possession only 39 per cent of its own coal cars and, counting foreign cars on its line, had only 51 per cent of the number of coal cars owned by it. It also presented statistics of the American Railway Association for October 1, showing that individual roads in the West, Northwest, Southeast and, especially, in the South had, counting foreign cars, less cars than they owned, the percentage on the Louisville & Nashville being 65. The roads in the remainder of the country generally showed above 100 per cent, New England averaging 122.

The commission has prepared ten questions for the carriers to answer in addition to the 17 published in the *Railway Age Gazette* last week. These ask for the average car mileage per day for the last four years; average shortage and surplus cars during that period; monthly loading reports by commodities, for August, September and October, this year and last; the total number of cars at terminals and industrial centers on September 30, in the last three years, classified as to loaded and empty cars, commodities carried, and detention of cars for various specified purposes, giving the number of days the cars were held under demurrage; tabulated statement of cars interchanged in September, this year and last, separating the loads from the empties; statement of cars used in interplant or intermill movements on September 30, this year; statement of any delays in unloading at local stations, with reasons; and the number and average tractive power of the locomotives owned, November 1, this year and last.

### Chicago to New York at 114 M. P. H.

Victor Carlstrom, flying in a 200 hp. Curtiss biplane, and making the journey under the auspices of the New York Times, arrived in New York City on Friday morning, November 3, completing a journey from Chicago in about 26 hours, including 14 hours at Hammondsport, N. Y., where he stopped over night. Carlstrom planned to make the journey through in a single day but was obliged to alight at Erie, Pa., because of a leak in a gasoline pipe; and the delay thus occasioned necessitated breaking the journey at sunset. The rate of speed, through, averaged 114 miles an hour; and from Hammondsport to New York, the average was 134 miles an hour. For most of the way there was a favoring wind. The aviator flew at from 2000 ft. to 8000 ft. above the earth most of the way. He left Chicago at about daylight on Thursday morning, and the time and distances, as reported by the New York Times are as follows:

Left Chicago (Eastern Time).....	7:09:30 a. m.	
Arrived Erie .....	11:27:00 a. m.	
Left Erie .....	2:34:00 p. m.	
Arrived Hammondsport .....	4:24:00 p. m.	
Left Hammondsport .....	6:35:00 a. m.	
Arrived New York.....	8:56:00 a. m.	
	Time.	Miles.
Chicago to Erie.....	4:17:30	452
Erie to Hammondsport .....	1:50:00	200
Hammondsport to New York.....	2:21:00	315
Flight time .....	8:28:30	967

### Railroad Conditions in Mexico

The National Railways of Mexico, now called the Constitutional Railways, show signs of life on all the important divisions. Jose Cerrucha has been appointed director general, succeeding Alberto Pani, now in the United States as a member of the peace commission.

Considerable betterment work is being done in the way of putting in new ties and ballasting. Equipment is very scarce. It is estimated that more than 20,000 cars have been destroyed and 500 locomotives made useless. In addition to this, several hundred locomotives are in the shops.

The trains between Matamoras and Laredo carry second-class cars, no sleepers; the locomotives are in bad condition. Only day cars are run on the line between Tampico and Monterey, and the locomotives are in bad condition. The engines on passenger trains between Laredo and the City of Mexico are in good condition. Trains are being operated between Laredo and Torreon, by the Penoles Mining Company with its own locomotives. The Oliver Transportation Company is running trains from Eagle Pass to the City of Mexico, carrying in supplies and bringing out cotton.

The line from San Luis Potosi to Tampico is in the hands of bandits most of the time, and the equipment is in bad condition. The line from Eagle Pass, by way of Paredon, to Saltillo, runs first and second-class cars daily, but no sleepers. The locomotives are in good condition, but the cars are in bad shape. The roadbed along the line from Paredon to Torreon is in good condition, but the cars are in bad shape. The engines are in fair condition. About four trains are run each way every week. The International from Torreon to Durango is in the hands of the bandits. An occasional military train makes its way through.

The line from Torreon to Chihuahua is also in the hands of bandits. This is the case with the line from Torreon to Zacatecas. The line from Zacatecas to Aguas Calientes runs trains by

daylight only. The engines are in fair condition, but the passenger equipment consists of box cars. On the line from San Luis Potosi to Aguas Calientes the track is in good condition and second-class cars are run. The locomotives are in fair shape. The track is in good condition on the line from Aguas Calientes to the City of Mexico. The locomotives are in fairly good condition. Mixed trains have first and second-class passenger cars but no Pullmans.

The line from the City of Mexico to Laredo uses the sleeping cars of the Mexican (Vera Cruz) Railroad. The track of the line from Guadalajara to the City of Mexico is in good condition and this road runs passenger trains composed of one sleeper and first and second-class cars. The sleeper belongs to the Mexican (Vera Cruz) road. Other cars are in bad condition. The line from Guadalajara to Manzanillo is in bad shape. It takes two days to make the trip, for it is not safe to run at night. Equipment is in bad condition.

The line from Tolca to the City of Mexico is operated by the El Oro Mining Company and is in good condition. The Cuernavaca division is out of commission except for the passage of military trains as far as Cuernavaca. The balance of the line is in the hands of the Zapatistas.

The Mexican (Vera Cruz) is being put into fine condition. The line from Pachuca to the City of Mexico is sometimes held by Legalistas and sometimes by Carranzistas. As may be imagined, it is in bad condition.

The Interocceanic, from the City of Mexico to Pueblo and thence to Vera Cruz, is three-fourths of the time in the hands of reactionaries. The line is in bad condition and four-fifths of the cars and engines have been destroyed.

The line from Pueblo to Oaxaca is out of commission except for an occasional military train. This line is in the hands of the reactionaries nearly all of the time. The equipment is in deplorable condition, but the track and bridges are in fair shape.

The Southern Pacific runs mixed trains by daylight from Nogales to Tepic, requiring four days for the journey. The track is in good condition with the exception of bridges destroyed and repaired. Engines are in fair condition.

#### Emergency Boarding Train

The Lehigh Valley has stationed at Easton, Pa., a complete emergency train, to be used to house and feed workmen at out of the way places on occasions of important repairs or serious troubles due to washouts and the like; and it is a sleeping as well as an eating establishment. The company bought two sleeping cars from the Pullman Company, and fitted up two coaches as additional bunk cars. A coach was stripped of its seats and a metal trough placed along either side at waist height for convenience in washing hands and faces.

Two former coaches have been equipped with longitudinal tables and two rows of seats for a dining car, and between them is a kitchen car, made from an old dining car. This is now equipped with additional range, steam-tables and refrigerator. Easton is the headquarters of the railroad's commissary department.

#### Association of Railway Electrical Engineers

The eighth annual convention of the Association of Railway Electrical Engineers was held at Hotel LaSalle, Chicago, October 31 to November 3. The following is a list of the exhibitors at the convention:

- Adams & Westlake Company, Chicago.—Straight and drop handle car brake, roundhouse headlight and lighting fixtures. Represented by W. J. Piersen, A. S. Anderson, G. L. Walters and J. F. Stender.
- American Pulley Company, Philadelphia, Pa.—Axle pulleys. Represented by J. S. Pratt and J. F. Forrest.
- Anderson Manufacturing Company, Albert & J. M., Boston, Mass.—Plugs and receptacles. Represented by B. G. Durham.
- Benjamin Electric Manufacturing Company, Chicago.—Reflectors and lighting fixtures. Represented by H. E. Watson, G. B. Weber, A. E. Lubeck and R. C. Mons.
- Central Electric Company, Chicago.—Okonite wires and cables, D. & W. products. Ralco receptacles and plugs, Maxolite reflectors, fans and other car lighting fixtures. Represented by J. M. Lorenz, L. G. Martin, D. Woodhead, E. C. Wilson, R. N. Baker and A. L. McNeil.
- Consolidated Railway Electric Lighting & Equipment Company, New York.—Electric car lighting equipment and regulator panels and dynamo. Represented by Thos. L. Mount, W. R. Hungerford, L. J. Kennedy and D. N. Balderston.
- Crouse-Hinds Company, Syracuse, N. Y.—Condulets, panel boards and round house headlights. Represented by A. F. Hills, C. H. Bissell, E. G. Smith, F. F. Skeel, C. Dubsky, E. C. Otto, C. W. Crowfoot, Chas. Gurney and J. Amos.

- Cutter Company, George, South Bend, Ind.—Switchboards and lighting fixtures. Represented by O. B. Duncan and F. L. Carl.
- Edison Storage Battery Company, Orange, N. J.—Storage batteries. Represented by H. G. Thompson, W. F. Bauer, F. V. McGuinness and H. M. Roberts.
- Davis Lighting System, Chicago.—Flood lights. Represented by W. J. Davis, F. M. Evans and W. O. Turtle.
- Electric Service Supplies Company, Philadelphia, Pa.—Golden Glow headlights and Darling-Henrici headlight turbo generators. Represented by C. J. Mayer, J. W. Porter, L. H. Darling, T. H. Henkle and O. Mueller.
- Electric Storage Battery Company, Philadelphia, Pa.—E. S. B. axle lighting equipment including truck and body hung type generator, panel switchboard, two cell unit storage battery lead lined tank of slotted crate construction and rubber jar two cell unit. Represented by G. H. Atkin, J. Lester Woodbridge, H. M. Beck, H. E. Hunt and O. R. Shortall.
- Fairbanks Morse & Co., Chicago.—Sectionalized alternating and direct current ball bearing motors and parts. Represented by M. O. Southworth, K. P. Brown, A. A. Taylor and F. M. Coudit.
- Franklin Railway Supply Company, New York.—Stone-Franklin axle generator and regulator. Represented by Floyd Coffin, H. D. Rodman and Henry Kloos.
- General Electric Company, Schenectady, N. Y.—Railway headlight set. Represented by B. F. Bilsland, S. W. McCune, Jr., J. Scribner, C. C. Bailey and J. Van Kerckhove.
- Gould Coupler Company, New York.—Regulating panel, body hung generator and lead battery accessories. Represented by G. R. Berger, W. F. Bouche, P. H. Simpson, J. O. Ashton and M. R. Shedd.
- Harter Manufacturing Company, Chicago.—Lighting fixtures. Represented by G. A. Harter, W. M. Soffe, D. E. Warrel and D. M. Ayers.
- Hart & Hegeman Manufacturing Company, Hartford, Conn.—Paiste switches and taplets. Represented by H. L. Everest, Jr., W. W. Winship and F. C. Church.
- Ivanhoe Regent Works of General Electric Company.—Lighting fixtures.
- Kerite Insulated Wire & Cable Company, New York.—Wire and cables. Represented by Azel Aimes, P. W. Miller, W. Fenley and J. A. Hamilton.
- National Lamp Works of General Electric Company, Cleveland, Ohio.—Mazda lamps. Represented by L. C. Kent and C. W. Bender.
- National Metal Molding Company, Pittsburgh, Pa.—Metal molding, Sherardized conduit, Flex-steel conduit, outlet boxes and a complete line of fittings for these devices. Represented by H. C. Moran and J. A. Bennett.
- Oneida Steel Pulley Company, Oneida, N. Y.—Steel pulleys and corrugated steel bushings. Represented by N. G. Stark.
- Pyle National Company, Chicago.—Type K and Type H incandescent headlights. Represented by Luther H. Steger, J. E. Kilker and J. Will Johnson.
- Pyrene Manufacturing Company, New York.—Fire extinguishers. Represented by G. R. Henderson, F. P. Murphy, W. H. Yetman and H. V. Flora.
- Safety Car Heating & Lighting Company, New York.—Underframe axle equipment, regulating devices and car lighting fixtures. Represented by C. A. Pinyerd, A. C. Moore, G. F. Hulse, J. H. Rodger, J. L. Marsh and W. H. Reader.
- Schroeder Headlight Company, Evansville, Ind.—Incandescent headlights, 32-volt incandescent generators and headlight case. Represented by G. M. Price.
- Sangamo Electric Co., Springfield, Ill.—Ampere hour meters, alternating and direct current Watt hour meters. Represented by A. B. Southwick, C. H. Koehler, C. H. Hurtt and E. Wray.
- Thompson Electric Company, Cleveland, Ohio.—Thompson Safety cut out hangers.
- United States Light & Heat Corporation, New York.—Car lighting generators, panels, batteries and various parts of lighting apparatus. Represented by R. C. Haley, H. A. Mathews, G. D. Ladd, W. L. Bliss and A. W. Donop.
- Western Electric Company, New York.—Enclosed power switches, lamps and lamp guards. Represented by J. C. Binning, George H. Porter, and T. J. Rider, Jr.
- Westinghouse Lamp Company, New York.—Mazda locomotive headlight lamps. Represented by W. H. Rolandson, A. N. Brown and J. G. Harvey.
- Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pa.—Motors and generators. Represented by R. L. McLellan, R. J. Ross, Chas. Robbins, W. H. Patterson, H. D. McKinney and H. W. Clark.
- Willard Storage Battery Company, Cleveland, Ohio.—No-wash type train lighting batteries and accessories. Represented by L. Sears, E. L. Meyers, I. R. Wentworth and L. B. Knight.

#### Correction

The report of the convention of the Maintenance of Way Master Painters' Association, appearing in the issue of October 20, page 705, referred to a statement by A. H. Sabin, of the National Lead Company, regarding the use of litharge in a red lead paint to resist water. Mr. Sabin's statement referred only to the addition of litharge to a red lead containing originally less than two per cent of litharge, and the brief abstract of the statement in the issue of October 20 did not make this point clear.

#### Western Railway Club

The regular monthly meeting of the Western Railway Club will be held at the Hotel Sherman, Chicago, at 8 o'clock Monday evening, November 20. The usual get-together dinner will be

held in the Italian room at 6:30. H. J. Beli, safety inspector of the Chicago & North Western will give an illustrated talk on "Railway Safety."

## MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meeting of those associations which will meet during the next three months. The full list of meetings and conventions is published only in the first issue of the Railway Age Gazette for each month.

- AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, January, 1917, New York.
- AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York. Next meeting, November 15, 1916, Brown Palace Hotel, Denver, Colo.
- AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.
- AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, December 5-8, 1916, Engineering Societies' Bldg., New York.
- AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January 23-25, 1917, New York.
- ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York. Next meeting, December 12-13, 1916, Atlanta, Ga.
- CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.
- CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.
- CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.
- CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.
- CINCINNATI RAILWAY CLUB.—H. Boutet, Chief Interchange Inspector, Cin'ti Rys., 101 Carew Bldg., Cincinnati. Regular meetings, 2d Tuesday, February, May, September and November, Hotel Sinton, Cincinnati.
- ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.
- GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month. Room 1856, Transportation Bldg., Chicago.
- NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Wm. H. Connolly, 1319 Columbia Road, Washington, D. C. Next convention, November 14, 1916, Washington, D. C.
- NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.
- NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.
- NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—E. N. Frankenberger, 623 Brisbane Bldg., Buffalo, N. Y. Meetings, 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.
- PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.
- RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.
- RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York. Next annual meeting, January 16, 1917, Waldorf-Astoria Hotel, New York.
- RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.
- RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Next meeting, November 9-10, La Salle Hotel, Chicago.
- RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.
- ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis, Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.
- SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grand Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 A. M., Piedmont Hotel, Atlanta.
- TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.
- TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.
- TRAFFIC CLUB OF NEW YORK.—C. A. Swope, 291 Broadway, New York. Regular meetings, last Tuesday in month, except June, July and August, Waldorf-Astoria Hotel, New York.
- TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.
- UTAH SOCIETY OF ENGINEERS.—Frank W. Moore, 1111 Newhouse Bldg., Salt Lake City, Utah. Regular meetings, 3d Friday in month, except July and August, Salt Lake City.
- WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco. Annual meeting, November 15, Brown Palace Hotel, Denver, Colo.
- WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.
- WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.
- WESTERN SOCIETY OF ENGINEERS.—E. N. Layfield, 1735 Monadnock Block, Chicago. Regular meetings, 1st Monday in month, except January, July and August, Chicago. Extra meetings, except in July and August, generally on other Monday evenings. Annual meeting, 1st Wednesday after 1st Thursday in January, Chicago.

## Traffic News

The railroads carrying grain to Philadelphia have been obliged to impose embargoes because of the crowded condition of the elevators and tracks in that city.

Early next month the Transportation Association of Chicago will occupy new quarters on the top floor of the Royal Insurance building. About 4,000 sq. ft. of space will be used, which will contain a gymnasium and shower baths, pool and billiard tables, a lounging and a reading room.

The National Industrial Traffic League held its annual meeting at Hotel Sherman, Chicago, on November 9 and 10. Among those scheduled to speak at the annual banquet on the first evening of the convention were Frank Trumbull, chairman of the Chesapeake & Ohio, and Julius Fleischmann, president of the Fleischmann Company, Cincinnati, Ohio.

The Southern Railway delivered at its new export coal tippie at Charleston, S. C., during the first year of its operation, nearly 150,000 tons of coal. Steamships taking coal from the pier for movement overseas numbered 98; 7 taking cargo, 14 cargo and bunker, and 77 bunker only. Of the cargoes, 14 went to Cuba, 6 to South America, and 1 to Spain. The export movement amounted to 63,123 tons, while 40,086 tons were bunkered. There was a coastwise movement of 46,255 tons, making a total of 149,464 tons. In addition 2,066 tons of iron ore and 2,114 tons of coke were exported.

An indictment, filling 153 pages, was recently returned by a federal grand jury, charging Herbert Herzstein with 20 offenses in misbilling shipments of grain products from Clayton, N. M., to Texline, Tex., and there reconsigning them to their final destination, using a combination of the local freight rates applicable upon shipments from Clayton to Texline, and then the local rates applicable in Texas to the point of final delivery. Herzstein is one of the largest shippers of grain and seed in New Mexico. There are several cases of alleged misdescription included in the list of alleged misbilling charges.

Traffic officers of the transcontinental railroads have been holding conferences with representatives of the western shippers in an effort to bring about some kind of an agreement as to a basis of freight rates to the Pacific Coast terminals and to the intermountain territory to be presented to the Interstate Commerce Commission in connection with the proposed new series of hearings in the transcontinental rate case. The carriers wish to advance rates to the Pacific Coast, in compliance with the commission's order requiring them to remove the discrimination against intermediate points because of the absence of water competition at the coast terminals due to the abatement of traffic through the Panama Canal.

The roads in the Trunk Line Association have adopted a new form of bill-of-lading to be used after the end of November, containing valuations to be used in shipping live stock. The maximum values for animals carried at the normal freight rates are as follows. (These valuations have been adopted also in Southern and Western territory):

Horses, mules, jacks, etc.....	\$150	Sheep .....	\$5
Colts, one year.....	75	Goats .....	5
Oxen, bulls, steers.....	75	Mare and foal .....	225
Cows .....	50	Cow and calf .....	70
Calves .....	20	Wild animals .....	250
Hogs .....	15		

When the value given by the shipper exceeds that specified in the table, an addition of 2 per cent will be made to the rate for each 50 per cent or fraction of additional value.

The Public Utilities Commission of Illinois suspended on October 26 the new suburban passenger rates which the Chicago, Rock Island & Pacific had announced to be effective in the Chicago district on November 1. On October 27 the commission began hearing protests of the Morgan Park, Washington Heights, Beverly, Longwood, Brainerd and Gresham improvement associations against the new rates. Residents of the Calumet region

of Chicago have petitioned the Commission to compel the Illinois Central to reduce fares charged on suburban service out of Chicago; to electrify the road; and to replace the wooden coaches now used in suburban service with steel coaches.

J. F. Porterfield, general superintendent of transportation of the Illinois Central, at Chicago, Ill., recently issued a bulletin which contains the following statement regarding car shortage: "Middle-western and southern railroads are again confronted with a serious car shortage. In order to increase the number of available cars the Illinois Central and the Yazoo & Mississippi Valley have within the past five years increased the average miles moved per car per day from 28 to 40 miles, or 43 per cent, which means that they have placed at the disposal of the shipping public some 1,325 additional cars per day. Our patrons released 25 per cent of loaded cars within 24 hours after being placed, 38 per cent within 48 hours, and 37 per cent within 72 hours or more. If all cars on these lines were loaded and released the day placed we should have for service about 1,000 additional cars daily. The conservation of equipment by confining it to the legitimate transportation activities would make a car shortage almost impossible."

A 23-hour train between Chicago and New Orleans will be placed in service by the Illinois Central on November 15. It will leave Chicago daily at 12:30 p. m., and arrive at New Orleans at 11:30 a. m., and will leave New Orleans at 12:30 p. m., arriving at Chicago at 11:30 a. m. A train will leave St. Louis at 4:30 p. m., with through sleeping cars, to connect with this train at Carbondale, Ill., and northbound this connection will arrive at St. Louis at 7:20 a. m. The train will be all-steel throughout and electric lighted, and will consist of Pullman sleepers, a dining car, a drawing room sleeping car, a buffet car and a composite drawing room compartment and observation car. The buffet car will contain a barber shop with four chairs and a shower bath. Ladies' maid service will be provided for the entire train and telephone service will be available before departure from Chicago and New Orleans. The new train will be called the "Panama Limited." The former train of the same name will continue in service under the title of the "New Orleans Limited."

The historical collection of the Traffic Club of Chicago, recently put on display in the parlors of the club in the Hotel La Salle, contains 515 separate exhibits, most of which pertain to railroad matters and more particularly to the activities of the traffic department. The collection was gathered by the Historical Committee under the direction of John T. Stockton, Chairman, and includes many books, newspaper clippings, pictures and railroad documents of historical interest. One interesting exhibit is a train time table prepared by the Chicago & North Western for a special train which was run for Dom Pedro, Emperor of Brazil, and dated April 19, 1876. Another is an entry of merchandise imported by George Ermactinger in a canoe commanded by Ignace Pickett from Sault Ste. Marie, in 1817. Other unusual exhibits are a three-dollar bill issued by the New Orleans, Jackson & Great Northern at Canton, Miss., on July 1, 1862, a five-dollar bill issued by the Madison & Indianapolis, dated December 27, 1842, and an order for the transportation of the Seventy-second Illinois Volunteer Infantry, U. S. A., dated 1865.

The New York, New Haven & Hartford has issued an embargo against all freight from its western connections except perishable freight, live stock, goods for the United States Government or for the railroad company, news and book print paper and coal and fuel oil; also on all freight in less than carload lots, regardless of the point of origin, when destined to Bridgeport, New Haven, Waterbury, Plainville or Hartford, with the same exceptions as above; also all freight to be exported from New York except as shippers show that steamship space has been contracted for. The New Haven road is now unloading about five thousand cars a day, which is 10 per cent more than at any previous time. The company reports that on November 6 there were 49,068 cars on the line, an increase of 2,777 cars since October 15, and the current daily movement through the different gateways and terminals is over 13,000 cars. The road has at the present time 975 cars under demurrage, averaging about five days per car; is holding 558 cars at destination ready to place when unloading tracks are relieved of cars ahead; is holding 1,915 cars set out at intermediate stations and terminals, and is confronted by an accumulation on connecting lines of 2,921

cars. This represents a total of 6,369 standing cars which are of no benefit to shippers or consignees, and which deprive other industries of that number of cars.

#### Freight Rate Advances in Central Territory

The roads in the Central Freight Association have issued new freight tariffs, to take effect December 1, making increases in both interstate and intrastate rates. The tariffs cover all of the six classes, but do not affect coal, stone and other commodities carried at commodity rates.

#### Panama Canal Traffic

In July of this year, the month of greatest traffic since the re-opening of the Panama Canal in April, the aggregate length of the 149 ships passing through the Canal was 53,905 ft., or approximately ten miles. The ships of the United States engaged in foreign trade numbered 3,135 on June 30, 1916, according to a report of the Department of Commerce. Their aggregate gross tonnage was 2,194,470, which is double the tonnage at the end of the preceding fiscal year. The net tonnage, reckoned as approximately seven-tenths of the gross, would be about 1,540,000 tons. The number of American ships passing through the Panama Canal in the fiscal year ending June 30, 1916, was 238, and their aggregate net canal tonnage was 737,169. Of these, 93 with 350,966 net tons were in the United States coastwise trade and 145 with 386,203 net tons, in the foreign trade. In the preceding fiscal year a much higher proportion of the American ships passing through the Canal was in the coastwise trade.

#### The Car Situation on the Southern Pacific

W. R. Scott, vice-president and general manager of the Southern Pacific, recently issued a statement on the freight car situation, which follows in part:

"In the period from 1910 to 1914, inclusive, the Southern Pacific bought 14,843 new freight cars to provide for the future, almost 6,000 of this number being box cars, over 3,300 refrigerator cars, almost 2,000 flat cars, 425 stock cars and 900 automobile cars. From 1910 to the closing months of the calendar year 1915, there had been practically no increase in freight traffic in the country. In the fall of 1915 the officials of the Southern Pacific concluded there was going to be a material improvement in the business situation, and therefore in December placed an order for 3,500 freight cars with builders of the east, this representing an addition of ten per cent to the equipment of the company. Delivery of these cars was promised in June and July of this year.

"The volume of business from the Pacific Coast has predominated eastbound through the year for the past several years. As a result of the closing of the Panama Canal and of the congested condition existing along the Atlantic Seaboard, the situation has been accentuated. On May 1, 1916, the total number of cars of all ownership on the Southern Pacific lines represented an equivalent of only 82 per cent of that line's own equipment. Telegrams were repeatedly sent to all lines owing us a balance, requesting the return of the cars and pleading the urgency of the situation. Some assistance has been rendered by the eastern lines, and on September 1, the total number of cars of all ownership on Southern Pacific rails represents an equivalent of 86 per cent of the cars owned by that line.

"The cause of the extreme shortage of equipment on the Pacific Coast at this time is due to the large increase in business on the coast and the eastbound movement this year compared with last year. For instance in the months of June, July and August there was an increased loading of 45,000 cars over the same period last year.

"A very material improvement in the situation could be made during the acute stage if all shippers and consignees would arrange to work on Sundays. It should be borne in mind that when no work is done on Sundays it means that one-seventh of the equipment is not used. Car builders who were to furnish the new equipment ordered last December have promised that the cars will begin to come forward within a short time. In order to relieve the situation on the coast as efficaciously and as promptly as possible the Southern Pacific has had these cars billed as empty, paying commercial freight rates thereon to the Pacific Coast."

## Commission and Court News

### INTERSTATE COMMERCE COMMISSION

The Commission has further suspended from November 12 until May 12, proposed increased rates on citrus fruits and pine-apples, c. 1. and l. c. 1., from Florida points to destinations in southeastern territory.

The Commission has suspended from November 10, and later dates, until March 10, the proposed cancellation of existing commodity rates on iron and steel articles, c. 1., between Chicago and related points and various points in Western Trunk Line territory.

The Commission has received from the Arizona Corporation Commission a complaint in connection with the transcontinental rate case, against the practice of the railroads in charging higher rates to Arizona from eastern points than for the longer haul to California points.

The Interstate Commerce Commission has suspended from November 5 until March 5, proposed increased rates on lumber in carloads from points in California to all points in Colorado on the Chicago, Burlington & Quincy, east of Brush and Sterling. The present rate is 40 cents and the proposed rate is 50 cents per 100 lb.

The Commission has issued a summary statement regarding the present practices of the larger roads in connection with the compilation of commodity statistics. The summary is issued for the dissemination of information on the subject and has been prepared from the returns made by carriers in response to a series of inquiries issued by the Commission, returnable on March 1.

#### Rates from Copperhill, Tenn.

*Tennessee Copper Company v. Southern Railway et al. Opinion by Commissioner Meyer:*

The complainant is engaged in mining and smelting copper ores and in the manufacture of sulphuric acid at Copperhill, Tenn. These cases involve the reasonableness of carload rates on certain traffic to and from its plant. The commission finds unreasonable: Rates on nitrate of soda in carloads from Charleston, S. C., and Savannah, Ga., to Copperhill, Tenn.; on pig lead in carloads from Copperhill, Tenn., to Atlanta, Ga., and on sheet lead in carloads from Atlanta to Copperhill.

It does not find unreasonable:

Rates on nitrate of soda in carloads from Pensacola, Fla., and New Orleans, La., to Copperhill; a rate of 82 cents per 100 lb. on nitric acid in carloads from Great Falls, S. C., to Copperhill, Tenn.; a rate of \$1.80 per ton on coke in carloads from Josephine and Dorchester Junction, Va., to Copperhill; rates on lumber, logs, poles and cross-ties in carloads from Murphy, N. C., and Ellijay, Sweet Gum, and McCullough Ga., to Copperhill; rates on lead dross and pig lead in carloads from Copperhill to Baltimore, Md., and other points and on sheet lead in carloads from Baltimore and some such points to Copperhill; rates on copper bullion in carloads from Copperhill to Baltimore, Md., and Perth Amboy, N. J., and to certain Virginia and South Atlantic ports; and rates on interstate shipments of coal in carloads from groups A, B, and E, on the Louisville & Nashville, to Copperhill. (41 I. C. C., 336.)

### STATE COMMISSIONS

The Public Utilities Commission of Illinois held a hearing on October 27, to consider the petition of the Belt Railway of Chicago for an increase in transfer rates. The present rate is \$3 for the transfer of loaded cars and half that amount for empty cars. The increase asked is 50 cents and 25 cents respectively. The hearing was continued until this week.

The Public Utilities Commission of Illinois has granted the railroads of the state a rehearing, scheduled for November 3, on its recent ruling with reference to the distribution of grain

cars. The railroads complain that they are unable to distribute cars in accordance with the ruling, which requires that they be apportioned to shippers on the basis of the number used in the last four years.

### PERSONNEL OF COMMISSIONS

John M. Atkinson, chairman of the Public Service Commission of Missouri, has resigned and will engage in the practice of law in St. Louis.

### COURT NEWS

The Federal grand jury at Salisbury, N. C., on November 2, returned indictments for violations of the law on two counts against the Carolina, Clinchfield & Ohio for granting concessions to a shipper by extension of credit on freight bills and on two counts against the Clinchfield Coal Corporation for receiving such concessions.

#### Assessment of Damages

In an action by an employee against a railroad for personal injuries under the employers' liability act, the Georgia Supreme Court held that it was error to charge the jury that "the value of the earning capacity of the plaintiff would have to be reduced to its present cash value"; it should have been that "the plaintiff's loss by reason of his decreased earning capacity should be reduced to its present cash value."—*L. & N. (Ga.)*, 89 S. E., 620.

#### Physical Connection Between Tracks

As the authority of the Alabama Railroad Commission to order physical connection between railroads to or through the same town or city, under Code 1907, Sec. 5535, depends on the sufficiency of business to justify the construction and maintenance of the connection, the Alabama Supreme Court holds that the commission has no jurisdiction to order such connection in the absence of evidence of this fact.—*Railroad Commission v. L. & N. (Ala.)*, 72 So., 397.

#### Lookout for Trespassing Children

In an action for personal injuries sustained by a person who was struck by a train, the West Virginia Supreme Court of Appeals holds that it is reversible error to instruct the jury that it is the duty of the engineman and fireman to keep a constant lookout for children that may be trespassing on the track. It is only necessary that they should keep a reasonable lookout.—*Stuck v. K. & M. (W. Va.)*, 89 S. E., 280.

#### Treating Condemnation Commissioners Invalidates Their Award

In a proceeding to condemn land for a railroad right of way the commissioners to assess damages were "treated, fed and entertained" during their investigation, and one of them was given a bottle of liquor by one of the parties having an interest in the case. The Virginia Supreme Court set aside the award, without regard to any actual influence on their award. The court applied the same rule as that applicable to juries, whose place the commissioners take in such a proceeding. Judgment for the defendants was reversed.—*New River, Hudson & Western v. Honaker (Va.)*, 89 S. E., 961.

#### Crossing Accident—Contributory Negligence

A train was coasting down grade at 35 miles an hour. The driver of a buggy, knowing of the presence of tracks and of the likelihood of trains being late, drove on to a crossing in a leisurely way, with the buggy curtains closed, so that he could not easily see an approaching train, and he was run down and killed. In an action for his death the Iowa Supreme Court held that, though the fireman saw the deceased drive onto the crossing, but too late to stop the train, liability could not be predicated on the theory that the fireman must have anticipated that because his buggy was rattling over frozen ground the deceased would not hear the train. Moreover, the deceased was guilty of contributory negligence, barring recovery.—*Duggan v. C. M. & St. P. (Iowa)*, 159 N. W., 228.

### Natural Results of Injuries

A track laborer sued a railroad, alleging that he had fallen twice as the result of working in replacing ties, with a dull pick supplied by the railroad, the falls causing tuberculosis of the shoulder joint. There was expert medical testimony that it would take in a man of the plaintiff's age from 14 to 24 months to develop the condition in which the plaintiff was found when he was taken to the hospital seven or eight months after the accident; that the condition could not have been produced by the falls; the tubercular germ must first be in the body, and that accidents do not produce germs. The Supreme Court of the State of Washington held that the tuberculosis was not the natural and probable consequence of the railroad's negligence, and it was entitled to a non-suit.—*Anton v. C. M. & St. P.* (Wash.), 159 Pac., 115.

### Change of Watercourse

A railroad by agreement with the adjoining land owner and for adequate consideration rightfully turned the course of a stream of water. The West Virginia Supreme Court holds that, in the absence of a contract to do so, the railroad is not liable thereafter to observe the action of the water, and to protect the banks or take other timely measures to prevent its encroachment on the adjoining land. It is the owner's duty to do so, and if he suffers damage by erosion, he cannot recover from the railroad. The bridge originally built by the railroad company across such a water course had decayed or been washed away by high waters, and by reason of the land owner's negligence in failing to protect the bank on his land the channel of the stream had been greatly deepened and widened. It was held that the whole burden of rebuilding the bridge and approaches thereto would not be enjoined on the railroad, but it might be required to join with the land owner in rebuilding the bridge and to pay or contribute thereto such sum as would have been required to build and maintain the crossing and bridge as if the conditions were the same as when it built the original crossing and bridge over the water course and right of way.—*Briscoe Home Trustees v. Ohio River* (W. Va.), 89 S. E., 727.

### Limitation of Liability—Georgia Rule

The agent of a company which had for a number of years shipped marble by railroad (most of it at a valuation of 20 cents per cubic foot, and some at a valuation of 40 cents) applied to the agent of a railroad company for a freight rate on rough building marble between two points in Georgia, and obtained a rate based on a valuation of 20 cents. He filled out a bill of lading on a blank which he had received from the railroad, stating the value to be 20 cents per cubic foot. He loaded the car which was furnished, and, under the regulations of the State Railroad Commission, obtained a rate of freight less than if he had placed a higher valuation on the marble. There was nothing further sufficient to show that the contract was a mere effort to limit liability, including that for negligence. The shipper later brought suit for damages to the marble alleged to have arisen from the railroad's negligence. The Georgia Supreme Court holds that the plaintiff was estopped from recovering a value beyond that fixed; and that the evidence did not authorize a finding that this was a mere arbitrary prearrangement to limit liability.—*Atlanta & West Point v. Fairburn Marble Co.* (Ga.), 89 S. E., 817.

### Effect of Condemnation—Damages

When a railroad company locates its road and gives a bond to secure damages, the bond being accepted by the land-owner or approved by the court, title to the right of way passes to the railroad company, and the owner is confined to his remedy on the bond. The company acquires right to exclusive possession, to fence it in, to build over the whole surface of the land, to raise and maintain any appropriate superstructure, including necessary foundations, and to deal with it within the limits of railroad uses as absolutely and as uncontrolled as an owner in fee. The plaintiffs in condemnation proceedings to, determine the damages to land were owners of three contiguous tracts, which were valuable as coal property, and could be worked to the best advantage as a single proposition. A railroad company

condemned a right of way over the smallest of the tracts; and in this tract it was most advantageous to have the opening to the mine. Because of this condemnation access from the mine to the nearby river was interfered with. The Pennsylvania Supreme Court held that in assessing damages the three tracts should be considered as one proposition, but the particular and special advantages accruing to and affecting the value of the land by reason of the presence of the railroad and the facilities offered by it should be considered. *Ferguson v. Pittsburgh & Shawmut* (Pa.), 98 Atl., 732.

### Automobile Crossing Accident—Contributory Negligence

In consolidated actions by the owner and driver of an automobile for injury to the car and a passenger in it for personal bodily injuries at a crossing, it appeared from the owner's testimony that he approached the crossing until within 5 or 6 feet of the rail, and there stopped for one of the passengers to alight and pay his fare. There was no contradiction that from the point of the accident, in the direction from which the engine and tender came, the track was perfectly straight, with a clear, unobstructed view for 900 feet. The owner said that after letting off the passenger, before starting across the track, he looked and listened in both directions, and neither saw nor heard the approaching engine; that he then started across and was in the middle of the track when he saw the engine about 30 feet from him; that he then shoved the throttle up and the car jumped 4 or 5 feet, and he jumped out and thus escaped. The Virginia Supreme Court considered that it was simply incredible that the driver of the car could have stood within 5 or 6 feet of the nearest rail and looked over a straight, unobstructed distance of 900 feet without seeing an engine that was within 30 feet of him as soon as he moved the very few feet necessary to put him in the middle of the track. The passenger could not rely on the driver, but had to look for the approach of the engine. Both were guilty of contributory negligence, and judgment for the plaintiffs was reversed and the cases ordered dismissed.—*Virginia & Southwestern v. Harris* (Va.), 89 S. E., 887.

### Right to Transport Passengers Carrying Liquor Into Dry State

In a suit for injunction by the state of West Virginia against the Baltimore & Ohio, the question was whether the state may restrain common carriers from allowing passengers to carry suit cases or other containers containing intoxicating liquors as unchecked personal baggage on the ground that the allowance of that privilege to passengers enlarges the opportunity for violation of the constitutional and statutory laws prohibiting the manufacture, sale and gift of such liquors. The West Virginia Supreme Court of Appeals holds that the statute of 1913, as amended in 1915, does not expressly or impliedly inhibit common carriers from transportation of passengers carrying with them, in their own personal custody, packages of intoxicating liquors, labeled in accordance with section 31 of the statute. Section 7 of the statute impliedly authorizes such transportation, by the use of terms from which legislative intent to do so is plainly inferable; and section 31 thereof, expressly recognizing and excepting the common-law right of a citizen to bring intoxicating liquors into the state, for his personal use, and prescribing the manner of doing so, without denying him the use of any of the means of travel ordinarily available, impliedly authorizes the use of such methods of travel in the carriage of such liquors. The court said: "If a railroad company cannot legally carry a passenger with a labeled liquor package in his possession, no other common carrier can do so. No steamboat could do so. No ferry could transport such a person across a river. No transfer omnibus, hack, cab, taxicab or other common conveyance could carry him on the streets of a city or town. Nor could he employ a private conveyance to carry him. He would be compelled to walk or furnish his own means of conveyance, however great the distance might be. To obtain what the statute allows him to have, a citizen in the interior of the state might have to walk or go by carriage, or on horseback, 100 or 200 miles, and then be refused passage across a ferry." Demurrer to the bill was sustained.—*State v. Baltimore & Ohio* (W. Va.), 89 S. E., 288.

## Railway Officers

### Executive, Financial, Legal and Accounting

W. B. Groseclose has been appointed assistant to the president of the Manufacturers' Railway, with office at St. Louis, Mo.

Arthur Coppel has been elected vice-president of the Denver & Rio Grande, with headquarters at New York. Mr. Coppel is a member of the board of directors.

F. W. Green, who resigned recently as general manager of the Louisiana & Arkansas, has been appointed assistant to J. M. Herbert, first vice-president of the St. Louis & Southwestern, with office at St. Louis, Mo.

David A. O'Brien, vice-president and general manager of the Rio Grande at Brownsville, Tex., has been elected president and general manager, assuming complete control of the road. James A. Browne, vice-president and treasurer, has been elected vice-president. John Gregg has been re-elected secretary and auditor.

W. C. Moore has been appointed freight claim agent of the Seaboard Air Line, with headquarters at Portsmouth, Va., reporting to the president, and W. G. Loving has been appointed attorney in charge of personal injuries, with headquarters at Portsmouth. On account of the promotion of W. L. Stanley, the office of general claim agent has been abolished, and the duties heretofore incumbent upon that office will be performed by the freight claim agent and the attorney in charge of personal injuries.

Benjamin Thomas Wood, whose appointment as assistant to the president of the St. Louis-San Francisco, with office at St. Louis, Mo., has just been announced, was born December 31,



B. T. Wood

1878, at Springfield, Mo. After attending the common schools of this city he entered high school from which he graduated in 1896. He took employment with the Kansas City, Fort Scott & Western as a stenographer to the division superintendent at Kansas City, Mo., in April, 1897, holding this position until January, 1899, when he became secretary to the general superintendent of this same road. From 1902 to 1904 he was secretary to the vice-president and general manager of the St. Louis-San Francisco, and was then made secretary

to the third vice-president of the Chicago, Rock Island & Pacific at Chicago, Ill. After serving as secretary to the president of this same road for a short while he was made chief clerk to the president in January, 1905, which latter connection he held until December, 1909. From that time to May, 1911, he was chief clerk to the president of the Chicago & Eastern Illinois and from May, 1911, to November, 1913, he was assistant to the vice-president of the St. Louis & San Francisco. In November, 1913, he was appointed second assistant to the chief operating officer of this same road and later advanced to the office of assistant to the vice president. His present promotion became effective October 3, 1916.

George W. Lamb, second assistant controller of the Louisville & Nashville, at Louisville, Ky., has been appointed assistant controller, with office at Louisville, vice A. J. Pharr promoted. H. F. Thompson has been appointed second assistant controller, succeeding Mr. Lamb. G. B. Reeves has been appointed auditor of disbursements, with office at Louisville, vice R. E. Sewell retired from active service; and G. R. White has been appointed

assistant auditor of disbursements, with office at Louisville, vice D. J. Duane retired from active service.

Alexander J. Pharr, whose appointment as controller of the Louisville & Nashville, with headquarters at Louisville, Ky., has already been announced in these columns, was born at Trion, Ga., and was educated in the public and private schools of Atlanta. After completing a business course he entered the service of the Atlanta & West Point and the Western Railway of Alabama in March, 1890, as stenographer in the auditor's office. He subsequently held various positions, including that of chief clerk, until 1893, when he became cashier and paymaster of these roads. In July, 1900, he entered the service of the Great Northern as accountant in the office of the assistant general superintendent at Spokane, Wash; later he became cashier of that road at Butte, Mont., and in December, 1901, entered the service of the Louisville & Nashville as accountant in the comptroller's office; shortly afterwards he was promoted to general bookkeeper and chief clerk. On September 1, 1910, he was appointed assistant controller, which position he held at the time of his recent appointment as controller of the same road, as above noted.

Walter Lawrence Stanley, who has been appointed assistant to the president of the Seaboard Air Line, with headquarters at Atlanta, Ga., as has already been announced in these columns,



W. L. Stanley

was born May 24, 1871, at Wytheville, Va. He graduated from Wytheville Male Academy, also from Emory & Henry College, and in 1890 and 1891 attended the University of Virginia. From 1893 to 1898 he served as attorney for the Norfolk & Western, and then entered the claim department of the same road. In September, 1901, he became claim agent of the Seaboard Air Line and in December, 1904, he was promoted to claims attorney. On November 30, 1907, he was appointed general claim agent, which position he held at the

time of his recent appointment as assistant to the president of the same road, with headquarters at Atlanta, in charge of public relations and taxes.

### Operating

J. K. Yohe, Jr. has been appointed assistant trainmaster on the Susquehanna division of the Delaware & Hudson.

Richard J. McDonald, road foreman of engines on the Chicago & Alton at Bloomington, Ill., has been appointed trainmaster, with office at Roodhouse, Ill., succeeding T. F. Shuman, resigned.

H. J. Humphrey, superintendent of car service of the Canadian Pacific, Eastern lines, at Montreal, Que., has been appointed superintendent of the Farnham division, with office at Farnham, vice J. H. Boyle, transferred.

W. M. Neal, assistant superintendent of the Canadian Pacific Eastern Lines, has been appointed acting superintendent car service, vice H. J. Humphrey, transferred, and L. J. Skelly has been appointed assistant superintendent, Montreal Terminals division, with office at Outremont, vice Mr. Neal.

J. P. Russell, general superintendent of the Virginia & Carolina Southern, at Lumberton, N. C., has resigned. J. Q. Beckwith has been appointed assistant to the general manager. The position of general superintendent has been abolished and the duties of that office have been assigned to the assistant to the general manager.

C. G. Lunday, superintendent of the Louisiana & Arkansas, at Stamps, Ark., has been appointed general superintendent in charge of operation and maintenance. F. W. Green, general

manager, has resigned, and the office of general manager has been abolished. F. L. Beal, valuation engineer, with office at Stamps, has been appointed superintendent.

W. C. Hudson, superintendent of the Washington division of the Southern Railway, at Alexandria, Va., has been appointed superintendent of the Asheville division, with office at Asheville, N. C., vice F. S. Collins and G. R. Buddin, trainmaster at Alexandria, has been appointed acting superintendent of the Washington division, with office at Alexandria.

A. W. Woodruff has been transferred from assistant superintendent of the Nebraska division of the Union Pacific with headquarters at North Platte, Neb., to assistant superintendent of the Wyoming division with headquarters at Ogden, Utah. It was incorrectly reported in our issue of October 20, page 713, that he had been made trainmaster at Ogden, Utah, succeeding A. W. MacDuffie, appointed assistant superintendent at Omaha.

Gordon Lee Hurley, whose appointment as superintendent of the Macon, Dublin & Savannah, with headquarters at Macon, Ga., has already been announced in these columns, was born on October 7, 1880, at Lumpkin, Ga., and began railway work in April, 1895, as a messenger on the Seaboard Air Line. He learned telegraphy and subsequently served consecutively as operator, train despatcher and chief despatcher. In August, 1914, he entered the service of the Macon, Dublin & Savannah as trainmaster, which position he held at the time of his recent appointment as superintendent of the same road, as above noted.

P. J. Flynn, whose appointment as superintendent of the Buffalo division of the Lehigh Valley, with headquarters at Buffalo, N. Y., has already been announced in these columns, was born in Ontario county, New York. He was educated in the public schools and at Canisius College, Buffalo. In April, 1884, he entered the service of the Lehigh Valley as a messenger boy and subsequently served successively as clerk, assistant, yardmaster, brakeman and conductor until January, 1893, when he was appointed yardmaster at Manchester, N. Y. He served later as assistant trainmaster at Sayre, Pa., and Geneva, N. Y., and as yardmaster at Sayre. In 1905 he went to the New York, New Haven & Hartford, as general yardmaster at Worcester, Mass., and later served at Providence, R. I. He returned to the service of the Lehigh Valley as yardmaster of the Buffalo division in February, 1907, and later he was made trainmaster of that division, which position he resigned to take up terminal work for the Grand Trunk. He subsequently served as manager of terminals of the Grand Trunk Pacific and the Canadian Northern, and now becomes superintendent of the Buffalo division of the Lehigh Valley, as above noted.

Harry D. Earl, whose appointment as general superintendent in charge of transportation and maintenance of the Midland Valley, with office at Muskogee, Okla., has just been announced, was born March 28, 1879, at Martin, Ohio. He received a common school education, and in June, 1896, began railway work at Amherst, Ohio, in the operating department of the Lake Shore & Michigan Southern. He was later for one year operator on the Toledo, St. Louis & Kansas City, now the Toledo, St. Louis & Western, and went with the St. Louis Southwestern in September, 1898, as an operator at Sherman, Tex. Later he was transferred to Commerce, Tex., and was then consecutively promoted to train despatcher at Commerce and Mt. Pleasant, chief despatcher at Mt. Pleasant, and for three years, from June, 1907, to April, 1910, he was trainmaster at Tyler, Tex. He was

promoted to assistant superintendent of the same line at Tyler in April, 1910, and was advanced to a division superintendency, with office at Mt. Pleasant, Tex., in 1911. He remained in this latter capacity until October 16, 1916, when his present appointment became effective.

John Adolph Streyer, whose appointment as general manager of the Macon, Dublin & Savannah, with headquarters at Macon, Ga., has already been announced in these columns, was born on October 27, 1874 at Macon, Ga., and was educated in the public schools. He began railway work on October 1, 1890, as a messenger with the Georgia Southern & Florida. From February to October 1891, he was clerk in the storeroom; then to January 1894 was clerk in the general freight agent's office and later served as assistant chief clerk in the claim department of the same road. From May 1894, to October 1898, he was in mercantile business at Macon, and then returned to railway service as traveling freight agent, on the Macon & Birmingham, and later served as traveling freight agent on the Atlanta & West Point and the Western of Alabama, at St. Louis, Mo. In February 1901, he became commercial agent of the Macon & Birmingham, at Macon and the following October was appointed general agent in the freight and passenger department at the same place. One year later he was appointed general freight and passenger agent of the same road at Macon, remaining in that position until February 1904, when he was appointed general agent of the Macon, Dublin & Savannah, at Macon. The following March he was promoted to general freight and passenger agent, and in April 1914, was appointed traffic manager which position he held at the time of his recent appointment as general manager of the same road as above noted.

#### Traffic

Archibald Fries, whose appointment as freight traffic manager of the eastern lines of the Baltimore & Ohio System, with headquarters at Baltimore, Md., has already been announced in these columns, was born on February 27, 1864, and was educated in the public schools at Cincinnati, Ohio. He began railway work in 1880 as an entry clerk on the Ohio & Mississippi, now a part of the Baltimore & Ohio System, in the transfer station at Storr's, Ohio, and subsequently served consecutively as cashier and chief clerk at the same place. From January, 1890, to November, 1897, he was successively chief clerk, rate and claim clerk, accountant, chief clerk and acting manager of the Continental Fast Freight Line; then, to October, 1898, he was chief clerk in the general freight department of the Baltimore & Ohio Southwestern. In October, 1898, he was appointed general agent at Cincinnati, and in January, 1899, became assistant general freight agent of the same road. From March, 1911, to January, 1913, he was also assistant general freight agent of the Cincinnati, Hamilton & Dayton. In January, 1913, he was appointed general freight agent of the Sharpsville Railroad; the same year he was appointed general freight agent of the Baltimore & Ohio at Pittsburgh, Pa., and now becomes freight traffic manager of the eastern lines of the Baltimore & Ohio System, as above noted.

C. B. Sipes has been appointed commercial freight agent of the Baltimore & Ohio with headquarters at Akron, Ohio, vice D. H. Streett, promoted.

L. J. Rowell has been appointed general freight and passenger agent and freight claim agent of the Apalachicola Northern, with office at Port St. Joe, Fla., vice T. M. True resigned.



P. J. Flynn



A. Fries

Henry Foulkes, for the past 13 years in the United States railway mail service, has been appointed mail traffic agent of the Delaware, Lackawanna & Western with office at New York City.

W. R. Askew, who has been appointed general freight agent, eastern lines of the Baltimore & Ohio System, with headquarters at Baltimore, Md., was born on November 30, 1873, at Baltimore.



W. R. Askew

Mr. Askew began railway work in January, 1888, as a messenger in the freight offices of the Baltimore & Ohio, and later held various positions in the general freight department. From September, 1899, to February, 1907, he was rate clerk, and then to January, 1913, he served as chief rate clerk. On January 1, 1913, he was appointed division freight agent of the same road, with office at Baltimore, which position he held at the time of his recent appointment as general freight agent of the Baltimore & Ohio Sys-

tem, at Baltimore, with jurisdiction over the territory east of the Ohio River except the Pittsburgh, Connellsville, Wheeling and Ohio River divisions and excluding the territory between Moundsville and Wheeling. Mr. Askew's entire railway service has been with the Baltimore & Ohio.

R. L. Butt has been appointed general freight agent of the Danville & Western, Blue Ridge Railway, Augusta Southern, Tallulah Falls Railway, Hartwell Railway and the Lawrenceville Branch Railroad, with headquarters at Atlanta, Ga.

Tom Giles Beard, whose appointment as general freight agent of the Southern Pacific, Texas Lines, with office at Houston, Tex., has recently been announced in these columns, was born in Bristol, England, on January 2, 1863. On coming to America in 1884 he took employment with the Louisville & Nashville, as clerk and stenographer to the assistant auditor. From 1885 to 1886 he held the same position with the master of transportation of the Louisville, New Orleans & Texas, now a part of the Illinois Central, and from 1886 to 1887 he was stenographer and operator in the superintendent's office on the East Tennessee, Virginia & Georgia. In 1887 he became connected with the Houston & Texas Central, and



T. G. Beard

after 1892 was consecutively stenographer, rate clerk, chief clerk in the general freight department and assistant general freight agent. In 1903, he was appointed assistant general freight agent of the Galveston, Harrisburg & San Antonio, the Galveston, Houston & Northern, the Texas & New Orleans and the Southern Pacific Steamship Lines jointly. From 1904 to 1912 he was general freight agent of the Texas & New Orleans, and from 1912 to 1916 he was assistant general freight agent of the Southern Pacific Lines in Texas, in charge of general solicitation. His appointment as general freight agent became effective on October 15.

R. C. Kennedy, southwestern passenger agent of the Cleveland, Cincinnati, Chicago & St. Louis, at St. Louis, Mo., has

been appointed assistant general passenger agent, with headquarters at St. Louis. J. C. Emig, industrial agent at Cincinnati, Ohio, has been appointed assistant general freight agent, with office at Cincinnati; H. J. Burgee, division freight agent at Chicago, Ill., has been appointed assistant general freight agent, with office at Chicago; S. A. Townsend, division freight agent at St. Louis, Mo., has been appointed assistant general freight agent, with office at St. Louis, and their former positions have been abolished. Effective November 1.

Philip Meininger, whose appointment as general freight and passenger agent of the Baltimore & Ohio Chicago Terminal, with office at Chicago, Ill., has been announced, was born at Cincinnati, O., on July 9, 1876. He received a common school education in this city and in 1891 entered railway service with the Ohio & Mississippi, now a part of the Baltimore & Ohio Southwestern, as a messenger boy. Later he became stenographer to the general baggage agent and engineer maintenance of way in turn. In 1896 he was promoted to chief clerk to a division superintendent on this same road. From 1898 to 1900 he was secretary to the engineer maintenance of way on the Baltimore & Ohio Southwestern at Cincinnati, O., and then became secretary to the division superintendent at Chicago, Ill. He was then promoted to chief clerk to the general superintendent of the Baltimore & Ohio and the president of the Baltimore & Ohio Chicago Terminal. In 1911 he was assigned to special work with the title of chief clerk, which position he held until his present appointment became effective October 15, 1916, succeeding P. F. Finnegan, promoted.

O. S. Lewis, who has been appointed general freight agent of the Southwest district of the Baltimore & Ohio System, with headquarters at Cincinnati, Ohio, was born on March 8, 1873, at Lawrenceburg, Ind. He was educated in the public and high schools, and began railway work as a clerk in the accounting department of the Kentucky Central at Covington, Ky. From January, 1892, to the following November he was in the accounting department of the Chesapeake & Ohio at Richmond, Va., and in the office of the agent of the same road at Cincinnati, Ohio. From November, 1892, to May, 1896, he was in the accounting department of the Ohio & Mississippi, now a part of the Baltimore & Ohio System, and then



O. S. Lewis

to November, 1906, served successively as agent of the Baltimore & Ohio Southwestern at Lawrenceburg, Ind., and chief clerk to the division freight agent at Vincennes, Ind. Mr. Lewis served until September, 1912, in the general freight office of the same road at Cincinnati, and then to January, 1913, was division freight agent of the Cincinnati, Hamilton & Dayton at Dayton, Ohio. In January, 1913, he was appointed division freight agent of the Baltimore & Ohio Southwestern at Cincinnati; in September, 1915, he was promoted to assistant general freight agent of the Baltimore & Ohio Southwestern and the Cincinnati, Hamilton & Dayton, and now becomes general freight agent of the Southwest district of the Baltimore & Ohio System at Cincinnati, Ohio, as above noted.

#### Engineering and Rolling Stock

William B. Smith has been appointed road foreman of engines on the Boston division of the Boston & Albany, with office at Beacon Park, Allston, Mass.

Edwin G. Foster, assistant engineer of the Buffalo, Rochester & Pittsburgh, has been appointed valuation engineer, with headquarters at Rochester, N. Y.

George W. Corrigan, roadmaster of the Southern Pacific at

Hornbrook, Cal., has been appointed division engineer of the Stockton division with office at Stockton, Cal.

William H. Vance, engineer maintenance of way of the Louisiana & Arkansas, at Stamps, Ark., has been appointed chief engineer and his former position has been abolished.

M. F. Clements, assistant engineer on the Northern Pacific, in charge of track elevation at Spokane, Wash., has been appointed engineer of bridges with office at St. Paul, Minn., succeeding H. E. Stevens, promoted.

B. J. Farr, general foreman of the Grand Trunk, who was recently promoted to master mechanic, with office at Battle Creek, Mich., graduated from high school at St. Albans, Vt., in 1893, and immediately entered railway service with the Central Vermont as a machinist apprentice. Later he was promoted to erecting shop foreman, and general foreman of the shop with this same company. In 1907 he resigned this latter connection with the Central Vermont to accept a position on the Northern Railway of Costa Rica, where he remained until 1909. About this time the opportunity to acquire broader railroad experience presented itself, and he resigned to enter government service on the Panama Railroad at the time the Panama Canal was being constructed. He served in various capacities with this company until 1914, when he returned to the United States and entered the service of the Grand Trunk as general foreman in January, 1915. His present appointment as master mechanic became effective October 1, 1916.

William A. Duff, whose appointment as assistant chief engineer of the Canadian Government Railways with headquarters at Moncton, N. B., has already been announced in these columns, was born on April 20, 1877, at Hamilton, Ont. He graduated from the University of Toronto in applied science in 1901, and began railway work in the same year as draughtsman and acting resident engineer on construction on the Vancouver, Victoria & Eastern, in British Columbia. In 1902 he was appointed assistant engineer on the Grand Trunk Railway at Hamilton, Ont.; the following year he went to the Kenwood Bridge Company as draughtsman at Chicago, Ill., and in 1905 he went in the same capacity to the Canadian Bridge Company at Walkerville, Ont. In 1907 and 1908 he was chief draughtsman in the bridge department of the Transcontinental Railway at Ottawa, Ont.; then until 1913 was assistant bridge engineer of the same road. He was appointed engineer of bridges of the Canadian Government Railways at Moncton, N. B., in 1913, which position he held at the time of his recent appointment as assistant chief engineer.



W. A. Duff

#### Purchasing

C. D. Clapp has been appointed purchasing agent of the Mississippi Central, with office at Hattiesburgh, Miss.

J. P. Harrison, assistant purchasing agent of the Louisville & Nashville, at Louisville, Ky., has been appointed purchasing agent, succeeding P. P. Huston, retired. H. T. Shanks has been appointed assistant purchasing agent.

M. E. Towner, special representative of the Whitman & Barnes Manufacturing Company, at St. Louis, Mo., has been appointed purchasing agent of the Western Maryland with office at Baltimore, Md., succeeding H. M. Birgan.

George W. Hayden, assistant to the chief purchasing officer of the St. Louis-San Francisco with office at St. Louis, Mo., has resigned to go to the New York, New Haven & Hartford as supervisor of materials and supplies with headquarters at New Haven, Conn.

## OBITUARY

### George R. Brown

George R. Brown, formerly and for 13 years general superintendent of the Fall Brook Coal Company's Railroad, and originator of "Brown's Discipline," died suddenly on November 5, at Rochester, N. Y.

He was born on September 9, 1840, at Southport, N. Y., and was educated in the common schools and at Waverly Seminary, Waverly, N. Y. In 1864 he began railway work as a telegraph operator on the Fall Brook road, now a part of the New York Central, and subsequently served until 1886, successively, as train dispatcher and assistant superintendent. In the spring of 1886 he was appointed general superintendent of the same road and served until May, 1899. He was then, to February 5,

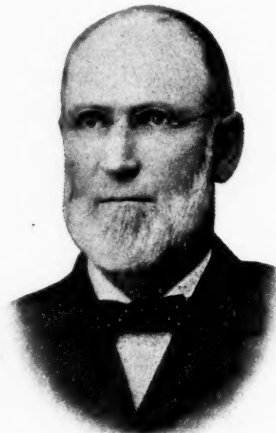
1902, second vice-president and general manager of the New York & Pennsylvania Railroad, with headquarters at Canistota, N. Y. From February, 1902, to July, 1904, he was receiver and general manager of the same road.

"Brown's Discipline," which has made this modest man's name known everywhere, means nothing more than the administration of the discipline of trainmen and other railroad employees by normal methods, without the employment of suspensions as punishment. Its adoption and persistent perpetuation on the Fall Brook was a notable event, because, first, suspensions were so common—nearly or quite universal—on all of our principal roads and, second, because the common practice of suspending men for 30, 60 or 90 days was everywhere recognized as a plan having serious disadvantages, while yet the task of managing five hundred or a thousand trainmen without the use of suspensions (as a proper means of impressing authority on men of dull minds or consciences) was generally looked upon as a very difficult one. Mr. Brown was peculiarly fitted for this function of the railroad superintendent, in that he was of sufficiently cold and judicial temperament to seek efficient men and to expel the inefficient, with regard solely to the good of the service, while yet he had the human sympathies which made him temper justice with those amenities which promote a true esprit de corps. His system was not a negative one; the use of admonition and reprimand in place of harsher measures was not his only reform; he paid an annual premium of \$60 to each freight conductor making a satisfactory record.

The Brown system (without the premiums) was adopted by many roads, and in 1899 the list included 30 or more companies; but some large roads have persistently maintained that a part of their trainmen—perhaps a very small part—were so dull, or tough, or reckless, or ignorant, or unprincipled that, for serious infractions of the rules, the only satisfactory punishment (where the offense did not seem to warrant dismissal) was a loss of money. Direct fines are thought to be out of the question, and suspension is the only other means of touching the pocket. A large number of roads still have "discipline without suspension" and others employ suspended or deferred suspensions, or other modifications.

The good results of the entire abolition of suspensions on the Baltimore & Ohio were the subject of an article in the *Railway Age Gazette* of January 16, 1914; and a similar report concerning the Chicago, Burlington & Quincy appeared June 12 of the same year.

Experiences like those here described, together with some of the same tenor on other roads, confirm the view of those who declare suspensions to be illogical, behind the times and often unjust; and they justify the verdict that Brown did a pioneer work of lasting value.



George R. Brown

## Equipment and Supplies

### LOCOMOTIVES

THE BIRMINGHAM SOUTHERN is inquiring for two six-wheel switching locomotives.

THE ST. LOUIS SOUTHWESTERN is contemplating the purchase of a number of locomotives.

THE MISSOURI, KANSAS & TEXAS is in the market for 25 Mikado and 10 Pacific type locomotives.

THE EAST ORANGE LUMBER COMPANY, Enterprise, Ore., has ordered one Mikado locomotive from the Baldwin Locomotive Works.

WORTH BROTHERS COMPANY, Coatesville, Pa., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works.

THE RIVER TERMINAL RAILWAY, Cleveland, O., has ordered two six-wheel switching locomotives from the Baldwin Locomotive Works.

THE GENERAL REFRACTORIES COMPANY, Hitchins, Ky., has ordered one four-wheel switching locomotive from the Baldwin Locomotive Works.

THE BRITISH GOVERNMENT has ordered 100 more light tank locomotives from the Baldwin Locomotive Works in addition to the 395 mentioned in last week's issue.

THE TEXAS, OKLAHOMA & EASTERN has ordered one Prairie type locomotive from the American Locomotive Company. This locomotive will have 18 by 24-in. cylinders, 46-in. driving wheels and a total weight in working order of 111,000 lb.

COATES & TWEED have ordered four six-wheel switching locomotives from the American Locomotive Company. These locomotives will have 19 by 26-in. cylinders, 50-in. driving wheels and a total weight in working order of 111,000 lb.

THE EL PASO & SOUTHWESTERN has ordered 10 superheater Pacific type locomotives from the American Locomotive Company. These locomotives will have 27 by 28-in. cylinders, 73-in. driving wheels and a total weight in working order of 315,000 lb.

THE WESTERN PACIFIC has ordered five superheater Mallet type locomotives from the American Locomotive Company. These locomotives will have 23½-in. cylinders, 53½-in. driving wheels, a total weight in working order of 147,000 lb., and will be equipped with superheaters.

THE ITALIAN STATE RAILWAYS were reported in last week's issue as having ordered 40 consolidation locomotives from the American Locomotive Company. These locomotives will have 21¼ by 27½-in. cylinders, 53½-in. driving wheels, a total weight in working order of 147,000 lb., and will be equipped with superheaters.

THE MINNESOTA STEEL COMPANY, Duluth, Minn., has ordered one six-wheel switching locomotive from the Baldwin Locomotive Works and one eight-wheel switching locomotive from the American Locomotive Company. The latter locomotive will have 23 by 28-in. cylinders, 50-in. driving wheels, a total weight in working order of 203,000 lb., and will be equipped with a superheater.

### FREIGHT CARS

THE NORFOLK & WESTERN is inquiring for 4,700 cars.

THE NORFOLK SOUTHERN is in the market for 150 cars.

SWIFT & Co. will build 300 refrigerator cars in its own shops.

THE WABASH-PITTSBURGH TERMINAL is in the market for 1,000 freight cars.

ARMOUR & Co. will build 500 additional refrigerator cars in its own shops.

THE NEW YORK, PHILADELPHIA & NORFOLK is inquiring for five caboose cars.

THE CAROLINA, CLINCHFIELD & OHIO has revived an inquiry for 100 automobile cars.

THE ATCHISON, TOPEKA & SANTA FE is reported as having placed an order for 500 tank cars.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE will soon issue inquiries for 500 box cars.

THE CAMBRIA & INDIANA has ordered 1,000 hopper cars from the Cambria Steel Company.

MORRIS & Co. has ordered 250 refrigerator cars from the Haskell & Barker Car Company.

THE UNION PACIFIC has ordered 1,500 box cars from the American Car & Foundry Company.

THE PIERCE OIL CORPORATION has ordered 200 tank cars from the American Car & Foundry Company.

THE CONSOLIDATION COAL COMPANY has purchased 800 coal cars from the United Coal Corporation.

COSDEN & Co., Tulsa, Okla., has ordered 200 tank cars from the American Car & Foundry Company.

THE ILLINOIS CENTRAL has ordered 400 Hart convertible ballast cars from the Rodger Ballast Car Company.

THE LOS ANGELES & SALT LAKE has ordered 1,000 automobile cars from the Ralston Steel Car Company.

THE DIAMOND GASOLINE CORPORATION has ordered 10 50-ton, 8,000 gal. capacity tank cars from the American Car & Foundry Company.

THE MINNEAPOLIS, ST. PAUL & SAULT STE. MARIE has ordered 800 box and 200 automobile cars from the Haskell & Barker Car Company.

THE DELAWARE & HUDSON is reported in the market for 118 steel underframes for hopper cars, 25 for stock cars and 25 for refrigerator cars.

THE PENNSYLVANIA EQUIPMENT COMPANY, Philadelphia, Pa., is in the market for several second-hand caboose cars and a number of rock cars.

RUSSIAN GOVERNMENT.—The report that the Russian Government has revoked the order for 4,000 gondola cars recently given the Bettendorf Company has been emphatically denied.

THE PHILADELPHIA & READING has ordered 1,000 hopper cars from the Cambria Steel Company, 500 from the Pressed Steel Car Company and 500 from the Standard Steel Car Company.

THE SOUTHERN RAILWAY, reported in last week's issue as having ordered 1,313 gondola cars from the Pressed Steel Car Company, has also ordered 200 stock, 100 caboose and 1,265 box cars from the Lenoir Car Works.

THE LOUISVILLE & NASHVILLE was incorrectly reported in last week's issue as having ordered 2,000 gondola cars from the Pressed Steel Car Company. These cars will be built, 1,000 in the company's own shops and 1,000 by the Mount Vernon Car Manufacturing Company.

THE BALTIMORE & OHIO, reported in last week's issue as having ordered 2,000 box cars from the Mount Vernon Car Manufacturing Company, has also ordered 375 box cars from the Ryan Car Company and an additional 375 box cars from the Mount Vernon Car Manufacturing Company. It is also in the market for 5,000 cars in addition to these orders.

### PASSENGER CARS

CHARLES M. SCHWAB has ordered a private car from the Pullman Company.

WELLS, FARGO & Co. is reported as inquiring for 30 express refrigerator cars.

THE NEW YORK CENTRAL, reported in last week's issue as having ordered 50 coaches from the Pressed Steel Car Company, 25 coaches from the Barney & Smith Car Company and 25 baggage cars from the Pullman Company, has also ordered 125 bag-

gage cars from the American Car & Foundry Company and 75 coaches from the Standard Steel Car Company, a total of 300 passenger train cars. This company reported in the *Railway Age Gazette* of October 13 as building a number of dining cars in its own shops, is building only 3 cars and not 4 as incorrectly reported in that issue.

### IRON AND STEEL

THE ST. LOUIS & SAN FRANCISCO will purchase 56,000 tons of rails.

THE DELAWARE & HUDSON has ordered 400 tons of bridge work from the Phoenix Bridge Company.

THE FRENCH GOVERNMENT is reported as having ordered 50,000 tons of rails from the Bethlehem Steel Corporation.

THE CHICAGO, BURLINGTON & QUINCY has ordered 25,000 tons of rails for 1917 delivery from the Illinois Steel Company.

THE GREAT NORTHERN has ordered 30,000 tons of rails and fastenings from the Illinois Steel Company for 1918 delivery.

THE SOUTHERN RAILWAY has ordered 500 tons of steel from the Virginia Bridge & Iron Works for car repair shops at Spencer, N. C.

THE NEW YORK & LONG BRANCH has ordered 1,000 tons of steel from the McClintic Marshall Company for a bridge over the Manasquan river.

THE RUSSIAN GOVERNMENT is reported to have ordered 50,000 tons of rails from the Bethlehem Steel Corporation for the Trans-Siberian Railway.

THE KANSAS CITY TERMINAL has given an order to the American Bridge Company to fabricate 25,000 tons of structural steel for a bridge over the Missouri river and approaches at Kansas City, Mo.

THE CHICAGO, BURLINGTON & QUINCY has ordered 3,000 tons of structural steel from the American Bridge Company for a freight house at Chicago to be built in connection with the Chicago passenger terminal improvements.

### MISCELLANEOUS

THE NEW YORK, CHICAGO & ST. LOUIS has awarded a contract to the Roberts & Schaefer Company, Chicago, for the installation at Brocton, N. Y., of a 300-ton capacity, reinforced concrete and steel locomotive coaling plant, designed to coal on two main line tracks, and a passing track.

THE PITTSBURGH & LAKE ERIE has awarded the contract to the Roberts & Schaefer Company, Chicago, for a large 900 ton capacity, reinforced concrete and steel fireproof coaling plant for installation at Haselton yard, near Youngstown, Ohio. This plant will be designed with four pockets and arranged to coal locomotives on four tracks; one of the bins being equipped with a "Rand S" measuring coal loader for recording all coal issued to foreign engines. The plant will be extensive in that duplicate track hoppers and automatic electric elevating equipments are part of the design.

### SIGNALING

The Public Service Commission of Maryland has authorized the issuance by the Western Maryland of notes aggregating about \$67,000, all to be paid within 5 years, to provide automatic block signals on the line between Colmar and Greenwood, 66 miles. This installation will complete the automatic signals on all the single track main line between Baltimore and Pittsburgh.

THE MISSOURI, KANSAS & TEXAS is to install an electro-mechanical interlocking plant at Eanita, Okla. The machine will consist of a 24 lever Saxby & Farmer frame with twenty-two working levers, and a six-lever style "S-8" electro section. The electric features of this plant consist of seven style "S" 110 volt home signals, three styles "S" 10 volt distant signals and four model 13 electric switch movements for the operation of four isolated switches and one electric dwarf signal of the slot arm type. The material for this installation will be furnished by the Union Switch & Signal Co.

## Supply Trade News

Hugh E. Creer, formerly connected with the sales department of the Union Railway Equipment Co. of Chicago, Ill., has been appointed special representative of the Camel Company, with headquarters at Chicago, Ill.

Fay E. Possom, formerly connected with the sales department of the Grip Nut Company, Chicago, Ill., has been elected vice-president of the Safety First Manufacturing Company, western representative for several different railway specialties.

Harrison dust guards, manufactured and sold by the Harrison Railway Specialties Company of Chicago, Ill., have been specified on the 5,000 New York Central cars recently ordered. Dust guards to equip 16,750 cars have been sold by this one company in the past two and one-half months.

The American Locomotive Co., has closed an order for 1,000,000 time fuses for the British Government, the contract providing for renewals at the option of the purchaser on another 2,000,000 fuses at the contract price. The order will be divided with the Westinghouse Air Brake Company, which company also shared the 2,200,000 fuse order placed with the locomotive company last summer and now nearing completion.

William Cooper Cuntz, general manager and director of the Goldschmidt Thermit Company, New York, died on November 2, at Auburndale, Mass., where he was on a visit for the benefit



W. C. Cuntz

of his health which was impaired by an operation for appendicitis a year ago. Mr. Cuntz was born in Hoboken, N. J., in 1871. He attended the Hoboken Academy and Stevens Institute of Technology, graduating in 1892 with the degree of mechanical engineer. He then became connected with the Pennsylvania Steel Company of Steelton, Pa., first with the bridge and construction department and later with the sales department, which he represented in Boston, Philadelphia, London, England, and in Steelton. He was at one

time assistant sales manager at Philadelphia and later sales agent with headquarters at Steelton. In 1910 he was appointed by President Taft a delegate to the International Railway Congress at Berne, Switzerland. In the same year he severed his connections with the Pennsylvania Steel Company to become a director and general manager of the Goldschmidt Thermit Company, New York. At the time of his death he was also a director of the Goldschmidt Detinning Company.

The United States Circuit Court of Appeals for the sixth circuit has affirmed the decree of the District Court of the United States for the eastern district of Michigan, sustaining the patent of James D. Carey, president of the Cleveland Dock Engineering Company, in his design of a reinforced concrete dock, in a suit brought by the Detroit Iron and Steel Company. This decision was rendered October 13, 1916, and sustains the priority of Mr. Carey's patent as originally developed in the construction of a dock for the Cleveland Furnace Company, Cleveland, and since used in other structures.

C. J. Burkholder, formerly general road foreman of engines of the Kansas City Southern, has accepted a position with the Economy Devices Corporation as mechanical representative in western territory, with headquarters at Kansas City. Mr. Burkholder was born May 8, 1875. His entire business life, up to

his recent appointment, has been spent in railroad work. Starting in the roundhouse of the Pennsylvania Railroad at Tyrone he was later locomotive fireman on the same road. Leaving the Pennsylvania he went as locomotive fireman for the Union Pacific and was later promoted to locomotive engineer. He resigned from the Union Pacific and went as locomotive engineer to the Kansas City Southern, northern division. He was in turn promoted to traveling engineer, train master and general road foreman of engines, holding the last position at the time of his recent appointment.

### TRADE PUBLICATIONS

**ELECTRICAL APPLIANCES.**—The Fargo Manufacturing Company, Poughkeepsie, N. Y., has recently issued a folder relative to its solderless connectors for solid or stranded wires and cables.

**GAS ENGINE.**—Bulletin 34-x, recently issued by the Chicago Pneumatic Tool Company, deals with Giant gas engines. The booklet describes in detail the engine and its various parts and is well illustrated.

**ADJUSTABLE REAMERS.**—Catalogue G recently issued by the Kelly Reamer Company, Cleveland, Ohio, is entitled Kelly Production Tools and is a catalogue of the reamers, adjustable high speed blades and similar tools made by the company.

**THE LOS ANGELES & SALT LAKE.**—The passenger traffic department of this company has issued a booklet entitled "The Organ and the Bells," illustrated with photographs and describing the scenic and historical attractions of Salt Lake City, Utah, and Riverside, Cal.

**KEEPING CARS IN SERVICE.**—This is the title of a booklet recently issued by the American Steel Foundries Company to show the advantages to be gained by the application of Economy cast steel draft arms to wooden underframe cars. The booklet contains several illustrations showing the Economy arms and their application.

**TRUCKS AND TURNABLES.**—This is the title of catalogue No. 124 recently issued by the Whiting Foundry Equipment Company, Harvey, Ill., dealing with the companies line of charging, dump, core oven and other foundry cars and turntables for use at crossings over which these cars are run. The book is well illustrated with views of the cars and turntables.

**"PECKY" CYPRESS.**—The Southern Cypress Manufacturers' Association, New Orleans, La., has issued a small 44-page booklet describing "Pecky" Cypress, which contains a large amount of information regarding this peculiar timber, its development and its uses. This book is prepared in an unusually interesting manner, and is well illustrated with photographs of this timber and its uses.

**MACHINE TOOLS.**—Catalogue No. 51 recently issued by the Newton Machine Tool Works, Inc., Philadelphia, gives specifications, dimension tables and illustrations of the Newton cold saw cutting-off machines. The booklet also contains a number of illustrations showing machines in actual service and a supplementary section is devoted to various milling, slotting and drilling machines.

**SMALL TOOLS.** Catalogue No. 9, recently issued by the Pratt & Whitney Company, Hartford, Conn., is a complete catalogue of the small tools manufactured by the company. The booklet has over 300 pages and gives data and price lists of the company's taps, dies, milling cutters, reamers, punches, drills and miscellaneous tools. About 40 pages are devoted to tables of standard threads, thread dimensions and tap drill sizes, decimal equivalents, etc.

**PAINT GUN.**—The Spray Engineering Company, Boston, Mass., in Bulletin No. 310 describes the "Spraco" paint gun, a hand tool for use in applying all kinds of liquid coatings. The complete equipment consists of the paint gun proper connected by flexible hose to a portable unit combining in a compact rugged form the material container, air dryer and strainer, pressure control attachment, and pressure gage. The equipment is adapted for use in shop or field and may be adjusted for spraying the highest grade of varnishes and lacquers, as well as heavy asphaltum and structural paints, producing finely finished surfaces without streaks or brush marks. It is also adapted to applying heavy durable coatings to rough structures.

## Railway Construction

**AMYVILLE RAILROAD.**—According to press reports from Amyville, Pa., this company has been incorporated in Pennsylvania with \$50,000 capital to build a five-mile line out of Amyville.

**BALTIMORE & OHIO.**—Improvement work has been started at the Garrett (Ind.) freight yards on the Chicago line of the Baltimore & Ohio. The yards are being enlarged to increase the capacity of eight tracks in the westbound yard and four tracks in the eastbound yard to 100 cars each. The work will cost about \$75,000 and will be carried out by company forces.

**CUMBERLAND & WESTERNPORT (ELECTRIC).**—This company, which operates an electric line connecting Cumberland, Md., with Westernport, is relocating 4,000 ft. of the line to secure easier grades and improve the alinement. The work is being carried out with company forces, and includes the construction of one steel bridge 24 ft. long, and a concrete wall 700 ft. long and 7 ft. high. Two power plants are also under construction.

**FLORIDA & ALABAMA.**—This road has been extended from Munson, Fla., north to Whittey, Ala., 20 miles.

**GREAT NORTHERN.**—The Eleventh district of the Butte division has been extended from Bynum, Mont., to Pendroy, nine miles.

**HOLSTON RIVER LUMBER COMPANY'S LINE.**—A contract has been given to the Vaughan Construction Company to build a 11-mile standard gage lumber railroad to the Clinch mountain district in Virginia. The work includes building a 200-ft. steel bridge. E. M. Allen, president, Darlington, Md., and H. T. Ballah, chief engineer, Abingdon, Va. (July 7, p. 47.)

**LEWISTON, NEZPERCE & EASTERN.**—Operation of a part of this road commenced November 1. This line when completed will run from Lewiston, Idaho, to Nezperce, Idaho, a distance of 75 miles. At present, however, only that part running from Lewiston to Tammany, a distance of 11 miles, and from Vollmer to Nezperce, Idaho, about 14 miles, will be operated. It is expected that the balance of the road, that part extending through Waha, Ilo, and Forest, and thence to Vollmer, will be finished next year.

**NEVADA-CALIFORNIA-OREGON.**—The Feather River branch has been extended from Clio, Cal., to Davies Mill, 2.67 miles.

**PENNSYLVANIA ROADS (ELECTRIC).**—According to press reports from Perkasié, Pa., plans are being made for building an electric line from Perkasié southeast to Doylestown, about 12 miles.

**RIO GRANDE RAILWAY.**—This company, operating 22 miles of line between Brownsville, Tex., and Point Isabel, Tex., has two surveying parties in the field locating a new route from Brownsville, Tex., to the gulf, the purpose being to renew water shipping through Brazos on Santiago harbor to Point Isabel.

**SCHUYLKILL RAILWAY COMPANY (ELECTRIC).**—This company is making surveys, it is said, for a proposed extension from Mahanoy City, Pa., to Tamaqua, about 14 miles. The work will include building a long viaduct and several small bridges.

**TENNESSEE ROADS.**—According to press reports, New York, Nashville, Tenn., and Chattanooga interests have under consideration the question of building a line from Nashville, Tenn., southeast to Chattanooga, about 125 miles. D. B. Carson, Nashville, Tenn., and W. H. Hillyer, Atlanta, Ga., are said to be interested.

### RAILWAY STRUCTURES

**BESSEMER, ALA.**—Construction of a modern, new freight station, between Seventeenth and Eighteenth streets, has been authorized by the Alabama Great Southern. The building will be of reinforced concrete and brick with sanitary plumbing, low pressure heating systems, steel windows and freight house doors, and wood block floor. The freight house will be 33 ft. by 205 ft. There will also be a platform 350 ft. and platform house will be served by necessary tracks. It is expected that construction will begin at once.

**COTTER, ARK.**—The St. Louis, Iron Mountain & Southern has just purchased the materials necessary for remodeling and adding another story to its passenger station here. The improvements will cost about \$7,000 and the work will be done by the company's own forces.

**DECATUR, ILL.**—Plans for a small brick machine shop with steel trusses, to be constructed here, are under way by the Wabash. No contracts have been awarded, nor is it known how soon bids will be called for. The cost will be approximately \$9,000.

**KANSAS CITY, Mo.**—The Kansas City Terminal has awarded a contract to the Arkansas Bridge Company, of Kansas City, Mo., for the erection of a steel bridge over the Kaw river. Actual construction has just commenced. The bridge will require about 25,000 tons of steel, and will cost approximately \$3,000,000. There will be two 300-ft. and one 135-ft. truss span over the Kaw river, and one 117-ft. and one 147-ft. truss span over the various railway tracks; also there will be a number of smaller girders for the various approaches totaling more than 800 feet. The superstructure will be of steel, with timber decking and foundations of reinforced concrete.

**MILFORD JUNCTION, IND.**—Work has been started by the Baltimore & Ohio on the building of seven steel bridges with concrete foundations between Milford Junction, Ind., and La Paz, 21 miles, on the Chicago main line.

**RINGTOWN, PA.**—A contract has been given by the Philadelphia & Reading to P. J. Campion, Mahanoy City, Pa., for the construction of two reinforced concrete box bridges. One will be 4 ft. by 4 ft. by 186 ft. long, to be constructed over Long Dark Run, and the other will be 12 ft. by 14 ft. by 50 ft., built over private road. When these structures are completed the existing steel viaduct, which is located south of Ringtown, Pa., on the Catawissa branch, will be filled in.

**ROCHELLE, GA.**—The Seaboard Air Line and the Ocala Southern are building a union passenger station at Rochelle.

**ROCHESTER, N. Y.**—The Pennsylvania Railroad will build an outbound freight house, 30 ft. wide and 240 ft. long at Rochester, to cost about \$50,000. The present freight house will be used as an inbound receiving station and additional tracks to hold 40 cars will be constructed between the two stations.

**TILSONBURG, ONT.**—Regarding the report that the Grand Trunk will build a new steel bridge at Tilsonburg, an officer writes that plans have not yet been made to carry out the work. If this improvement is made the work will be done by company forces.

**TUSCALOOSA, ALA.**—The Alabama Great Southern has just completed and placed in service a modern freight station at Tuscaloosa in the heart of the business district. The station is 30 ft. by 196 ft. and has facilities for accommodating both inbound and outbound freight. Team track facilities for handling car load freight have also been constructed. The old station, situated some distance east of the principal business section, will be maintained to serve shippers and receivers in that immediate vicinity.

**THERMALENE DEFINED.**—Thermalene is a gas, the discovery of which was recently announced from Zurich, Switzerland. It is used for welding and cutting in the same manner as acetylene is used with oxygen. It is produced by the decomposition of calcium carbide with water and is enriched or compounded with the heated vapors of crude oil. There are several claims made for it. It is heavier than air, specific gravity 1.1, and it is said it can be used at a lower pressure than the other gases. It is not explosive when liquefied, and its explosive range is narrow, the explosive ratio from 12 per cent to 30 per cent air. It can be liquefied at a pressure slightly over 1,400 pounds and at the ordinary atmospheric temperature. An excess of oxygen is not required in the welding flame, so that there need not be any reduction of the carbon in the iron or steel that is being welded, thus producing a soft weld. It is generated automatically in a portable apparatus as needed and delivered to the torch at 15 pounds pressure. The special feature in its production is the use of cartridges of material, consisting of alternate layers of calcium carbide and sawdust soaked in oil. It is necessary to wash, purify and cool the gas. The introduction of this gas into the iron and steel industries of the United States will be watched with interest.—*Iron Trade Review.*

## Railway Financial News

**BUFFALO & WELLSVILLE.**—This road was to have discontinued operations on November 1, as announced in these columns previously. Following an informal conference with the New York Public Service Commission, Second district, the management agreed to continue service until November 17. Another conference will be held with the commission on November 15.

**CHICAGO, BURLINGTON & QUINCY.**—Ralph Budd has been elected a director, succeeding R. A. Jackson, resigned. George D. Slade has been elected a director, succeeding W. T. Clough, deceased.

**CHICAGO & EASTERN ILLINOIS.**—Suit has been brought by the Farmers Loan & Trust Company to foreclose the Evansville & Terre Haute first general mortgage securing \$3,145,000 outstanding 5 per cent bonds.

**CLARKSVILLE RAILWAY.**—This road, which runs from Tallulah Falls to Clarksville, and which was recently sold under foreclosure, has notified the Georgia railroad commission that it desires to tear up its tracks and go out of business. The commission has notified the railroad company that the commission has no power to grant such a petition and that the company would have to surrender its charter to the legislature to relieve it of the necessity of operating its road.

**DENVER & RIO GRANDE.**—The Wall Street Journal, in its issue of November 4, prints the following:

Arthur Coppel, when asked after the board meeting Thursday what was the significance of his election as vice-president of the Denver & Rio Grande, said:

"My election as vice-president of the Denver & Rio Grande emphasizes the freedom of that property from the control of any one interest. The Denver & Rio Grande is now being operated, and will continue to be operated, as an independent property. It is the theory of election of directors that all stockholders should be represented, and it is, of course, the duty of each director to act solely in the interest of the property for which he is trustee.

"In this connection it is to be said, in order to correct mistaken impressions to which certain recently published reports have given currency, that seven of the directors elected at the last annual meeting of the stockholders were the choice of the two largest stockholding interests in this country, viz., Gould and the Missouri Pacific Railway—say three and four respectively—and they, as well as the other four directors, were unanimously elected.

"My own and Mr. McAlpin's connection with the property, of which my father was for many years chairman, rests mainly (apart from my individual holdings) upon the fact of my being the proxy of the Dutch administration, the latter representing the very considerable holdings of stock in Holland, and being the second largest stockholder in the company.

"I may add that I am informed that the report repeatedly published of late to the effect that the Missouri Pacific has disposed of its holdings of Denver & Rio Grande stock is without foundation."

**GREAT NORTHERN.**—A. Barton Hepburn, chairman of the Chase National Bank, of New York City, has been elected a member of the board of directors of this company, succeeding R. A. Jackson, resigned.

**RIO GRANDE.**—This company has passed under the control of David A. O'Brien and associates. The board of directors was reorganized as follows: David A. O'Brien, chairman, and James A. Browne, John Gregg, Albert Browne, Louis Coboline and R. M. Johnston, members.

**ST. LOUIS & SAN FRANCISCO.**—Lee, Higginson & Co., Boston, and the Guaranty Trust Company, New York, have formed a syndicate to sell the \$8,516,000 St. Louis & San Francisco prior lien 5 per cent bonds left with the reorganization committee.